

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Trappen's Valve Gear.

For many years rolling engines have enjoyed the doubtful fame of being the most

shaft L. The diagram, Fig. 3, will plainly show the action. The edge of the tongue F moves in an oval. The extreme edge of F, the center of the eccentric and the point K, form a right-angled triangle, the right angle

the governor balls fall, the tongue F strikes G, and that, as G is moved in, the engagement lasts longer and longer, until 0.8 of the stroke, the latest cut-off for which the gear is set. The governor, therefore, has

stopping the machinery in case of accidents, to which this class of machinery is liable. By moving the lever the engineer can stop the supply of steam at once. A vacuum is produced in the cylinder, which counteracts

The United States increased its importation from 19 tons in June, 1877, to 312 tons in June, 1878, and to 4834 tons in June 1879. The exports of railway iron in the first six months of this year aggregated 209,599 tons,

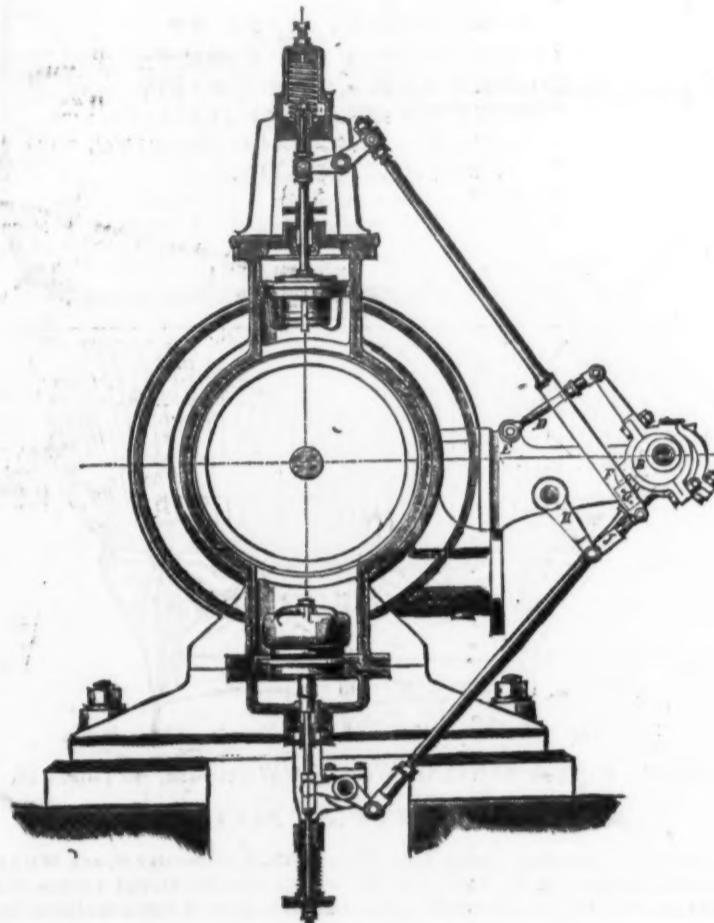


Fig. 1.—End View.

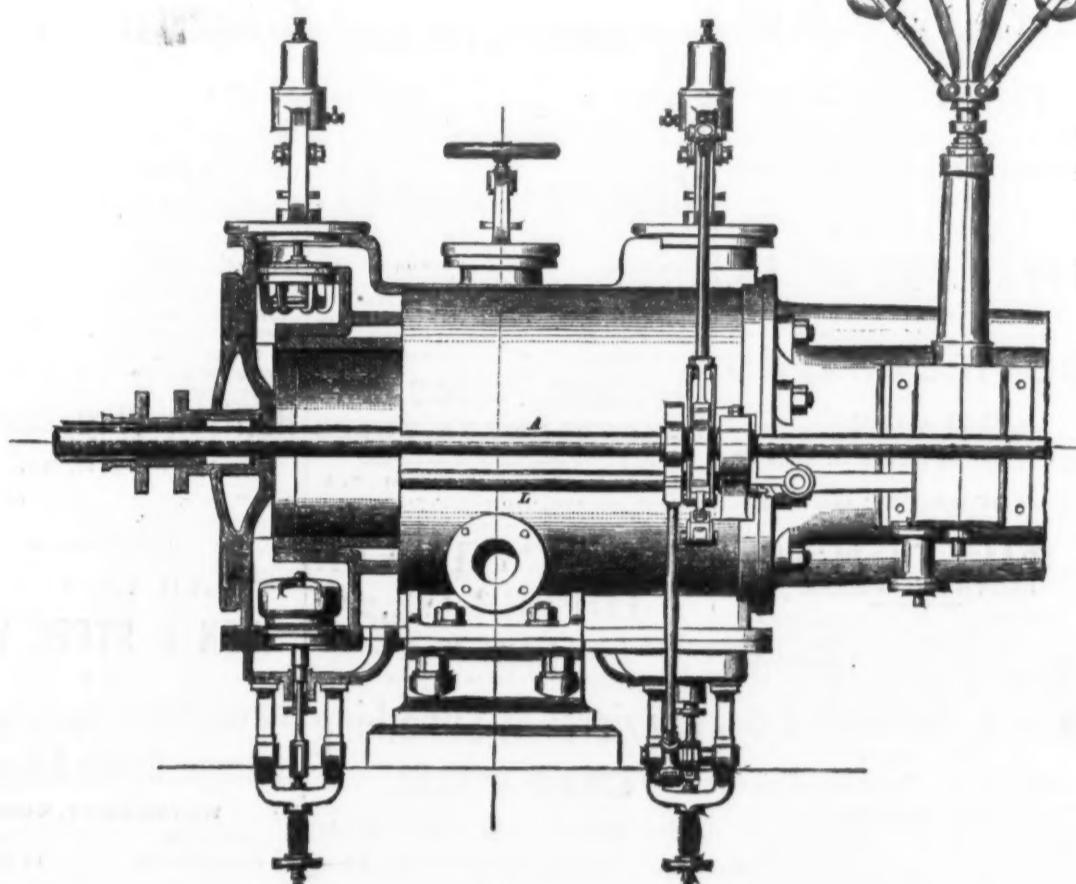


Fig. 2.—Side Elevation.

wasteful in regard to fuel. It was held, with much show of truth, that the sudden and violent shocks to which this class of engines are liable, rendered the application of any delicate appliances impossible, and it became the aim of designers to make rolling mill engines simple and ponderous, so as to guard against the danger of sudden breakage, without paying much attention to fuel economy. A notable departure from this direction has been made by Mr. Porter in the Allen engine, whose rolling mill engines deservedly rank high in the estimation of managers. It may be of interest to show to our readers in which direction Continental designers are working. We present in the accompanying illustrations Trappen's valve gear, for which we are indebted to *Glaeser's Annalen für Gewerbe und Bauwesen*. This gear has been applied by the builders, the *Märkische Maschinenbau-Anstalt*, of Wetter a. d. Ruhr, Germany, to rolling mill engines, with the object of decreasing the amount of steam used. Of course, the gear is applicable to all engines generally, but it is to its use in the class mentioned in the above that we are particularly interested, as the gear is one of the simplest of the type to which it belongs, and is, therefore, well adapted for rolling mill engines.

The gear is actuated by a lay shaft, A, which is driven from the fly-wheel shaft by means of conical gearing. Generally, in modern engines, the steam valves are placed above the cylinder, while the exhaust valves are below it, and accordingly the lay shaft is placed beside the cylinder, as shown in Figs. 1 and 2. The shaft carries four small eccentrics, two of which, B, work the steam valves by the intervention of levers, while two others operate the exhaust valves. These eccentrics have short rods, the ends of which are simply connected to rocking arms, D, swinging on fixed pins, E, Fig. 1. At F the eccentrics, B, Fig. 1, carry a hardened steel tongue, F, which acts upon the hardened face, G, of a steel block inserted into the furated connecting rod. The revolutions of the lay shaft, A, cause the eccentric strap to make both a pendulum and an up and down motion. Every part of the tongue, F, therefore, moves vertically as well as horizontally, so that within a certain range its face remains parallel to the face of the block G of the connecting rod. The tongue moves the latter, gradually slipping from the face of G so that it releases it after a given time, and permits a spring in the box above the valve to promptly close the latter. The time during which the tongue acts upon the connecting rod is dependent upon the distance between G and the tongue F. When the connecting rod is closer to the tongue, the time will be longer, while a shorter distance will proportionately shorten the time of contact. It is evident that the steam valve of the engine will accordingly remain opened for a longer or shorter period, and that the cut-off is dependent upon the position which G occupies.

It strikes the block G at a low speed, but opens the valve very rapidly while the surface of contact is large. The numbers in Fig. 3 show that as G is moved toward the eccentric, as

complete control of the cut-off from 0 to 0.8 of the stroke, with a very small motion of the lever H. The lead may be adjusted within certain limits by shortening or lengthening the connecting rod D, so that it

the motion of the fly-wheel and stops the engine rapidly.

British Iron and Steel Exports for 1879.

The statistics of British iron and

against 247,805 tons in the first six months of 1878, and 228,480 tons in the first six months of 1877. The exports to the United States in the first six months of 1877 were 2902 tons; in the first six months of 1878 they were 464 tons; and in the first six months of 1879 they were 7738 tons. The total exports of all forms of iron and steel aggregated 194,628 tons in June, 1879, against 210,993 tons in June, 1878, and 223,055 tons in June, 1877. The total exports of the same commodities in the first six months of 1879 were 1,213,628 tons, against 1,127,608 tons in the first six months of 1878, and 1,118,183 tons in the first six months of 1877.

The Hydrostatic Boiler Test.—A Philadelphia coroner's jury, recently impaneled in the case of a boiler explosion at the factory of A. Wilt & Son, took exception to the hydrostatic test for steam boilers used by the Hartford Steam Boiler Insurance Company, characterizing it as excessive. To this the company's agents have made the following reply, which will be read with interest by steam users: "The hydrostatic test is exactly that employed by the United States government in all its inspections of steam boilers; hence the inconsistency of the jury in condemning the United States standard in one portion of their verdict and recommending its adoption, as they do, in another, is self-evident. The United States law requires the hydraulic test to be 50 per cent. above the steam pressure carried. In this case the steam pressure desired was 80 pounds to the square inch, and the hydraulic test applied, as shown by the accompanying affidavit of the inspector, was 120 pounds, precisely the United States standard, which is conclusive evidence that the hydrostatic test was not excessive. Further, it is well known to all steam users at least, that the policy of the company is opposed to the hydraulic test as a sufficient inspection of steam boilers, and that it is applied only when local laws require it, as is the case in Philadelphia, except in rare cases where internal examination is impossible. The time is probably not far distant when the hydrostatic test as the only method of inspecting steam boilers will be abolished. This question is being very fully discussed, both in this country and in Europe, and the opinion of those most familiar with steam boilers is that the hydrostatic test alone is not sufficient."

Certificates of incorporation have been filed in the County Clerk's office by the "Steam Heating Power Company of New York." They state their purpose to be similar to that of the Spinola Company. Their capital stock is \$5,000,000. The trustees are Hawley P. Clapp, Wallace C. Andrews, Ashbel W. Humphreys and Jas. W. Hawes.

A cannon of 24 centimeters caliber burst on board the German gunboat *Renown* at Wilhelmshaven recently. Five men were killed and 25 wounded.

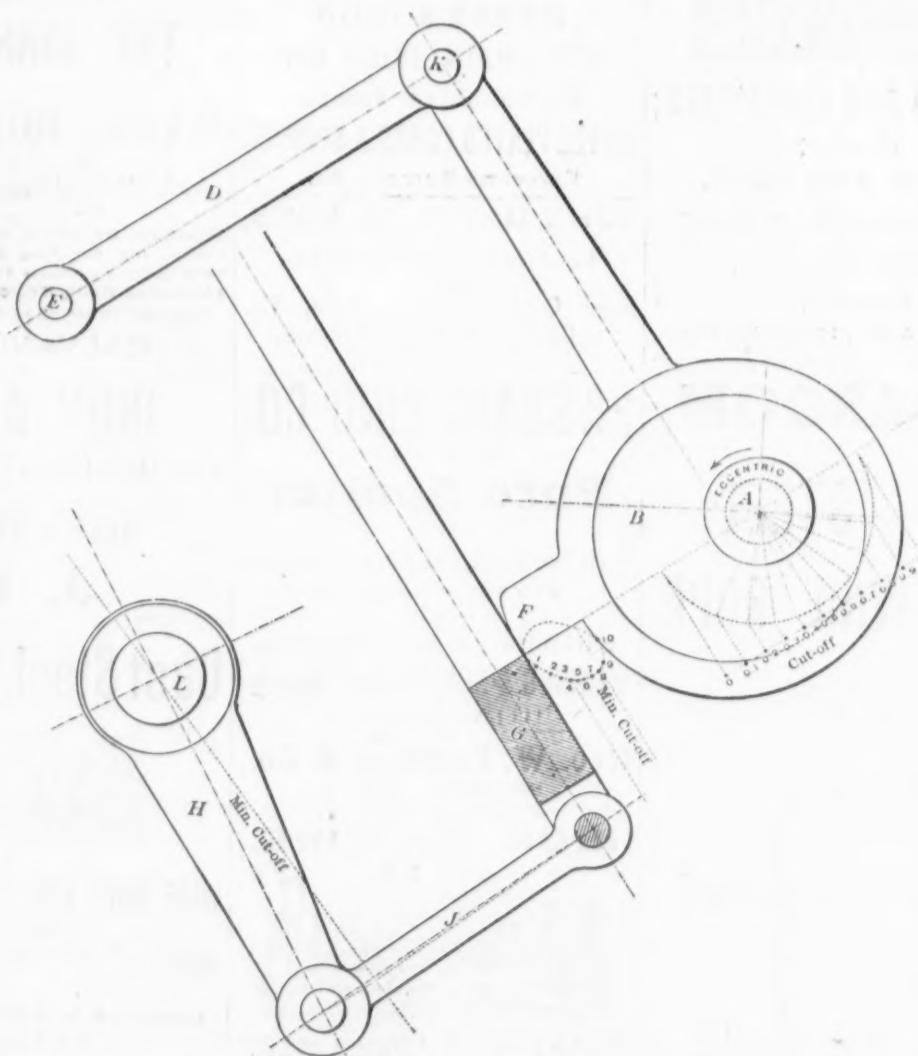


Fig. 3.—Diagram of Valve Motion.

TRAPPEN'S VALVE GEAR.

steel exports for the month of June and the first six months of the year have been received. The exports of railway iron in June were 40,992 tons, against 51,198 tons in June, 1878, and 63,970 tons in June, 1877.

to engage the connecting rod. It strikes the block G at a low speed, but opens the valve very rapidly while the surface of contact is large. The numbers in Fig. 3 show that as G is moved toward the eccentric, as

is not necessary to move the eccentric. The exhaust valves are operated by ordinary eccentrics. For rolling-mill engines the builders add a hand lever to the governor shaft L, in order to provide a means for rapidly

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SEE PAGE 9.

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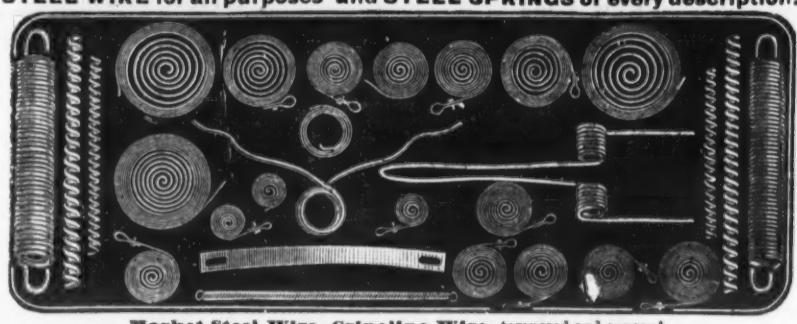
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Artesian Well Boring in San Francisco.

San Francisco is largely supplied with water by artesian wells, of which, it is said, there are not less than 200 in the city. While in London and elsewhere it has been observed that the supply of each well decreases in proportion to the increase in the number of wells, such an effect has not been observed in San Francisco. In some of them the water is reached at a very small depth. One of the hotels is supplied by a well 38 feet deep. Another has a well 60 feet deep, furnishing 6000 gallons of water per day. A candle factory has a well 168 feet deep, which gives a supply of 10,000 gallons per hour. The *Chronicle* has been putting up a building, for which a new well is being bored, which is expected to supply 8000 gallons per day. One reason for the large number of artesian wells in the city has been the extortionate rates charged for water by the corporations through which the city has received its supply. Like nearly all the corporations of California, these water companies have manifested and intolerably insolent and rapacious disposition.

The San Francisco *Bulletin* says: Near the entrance to the Odd Fellows' Cemetery an artesian well is being sunk by the California Artesian Well Company, using the Pierce well-excavating machinery, which is here first tried on this coast. The machinery is simple but effective, and is driven by horse-power. The machinery for excavating in earth or sand is similar to that used by other well borers in this city. The great advantage in this system of machinery is that a 6-inch hole can be put through solid rock at the rate of 10 or 15 feet per day. The power is obtained by attaching horses to a large wheel placed horizontally, and having teeth on the under side. These teeth play into a pinion to which is attached a shaft. As the horses go around, the shaft is kept revolving. The shaft is in several pieces, connected by improved joints so that motion can be given to the machine in almost any position it may be put. The revolving shaft is attached in the machine to another shaft, upon which is a casting having something the shape of a crank in an engine, and about 2 feet long. The shaft revolving causes this crank to revolve also. Beneath the crank is a lever, the fulcrum being at the extremity of the machine furthest away from the crank. When horizontal on the bed of the machine, the lever is about 2 feet below the shaft of the crank, which it just touches during the revolutions of the crank. About 2 feet from the fulcrum of the lever a rope is attached, which passes up some 20 feet to the top of a tripod, placed over a hole in the ground. The rope passes over a pulley at the top of this tripod, and is then attached to a Z-drill weighing 700 lbs. The drill having been lowered into the well, the horses are started, causing the crank to revolve. By touching a lever, the end of the lever to which the rope suspending the drill is attached is liberated, and the drill falls, drawing up the lever. The revolving crank then strikes the end of the lever, presses it down to its bed, raising the drill, and as it passes beyond liberates the lever, and the drill falls again. Thus the drilling is rendered very easy, the only labor being that of the horses, which are constantly walking in a circle. If it is desired to stop drilling, a spring is touched and the lever is retained in the bottom of the bed where the revolving crank cannot touch it. By simply tightening a loose belt, motion is at once given to the roller about which the rope is wound, and the drill is rapidly raised to the surface. By another lever motion is transferred to another roller, and the sand pump, when lowered, is raised with great rapidity. The machine saves an immense amount of labor and time, as anyone who examines it can readily see. The well at the Odd Fellows' Cemetery is now down 100 feet, some 30 feet of the bore being through solid blue rock, which the drill finds no difficulty in penetrating. It is expected that the well will be put down another 100 feet before work is stopped, unless water is tapped before that depth is reached. The cemetery has heretofore been dependent altogether upon water obtained from surface wells, but the supply has been insufficient. The well now being bored by the California Artesian Well Company is an experiment, to test whether the stratum of blue rock underlying the cemetery is water-bearing. The contract of the company is to bore 200 feet, unless water is struck in less distance than that. At a depth of 200 feet only about 130 feet of rock will have been penetrated, and in that short distance it is not at all probable that water-bearing seams will be encountered. Unless the managers of the cemetery determine to penetrate through the stratum of blue rock into the stratum underlying it, it is not at all certain that the experiment will be a success, beyond demonstrating the efficiency of the machine, which has been amply demonstrated elsewhere.

of cash buyers, a great many discounting their bills instead of giving notes.

Swift's rolling mill has been obliged to refuse orders for rails at advanced rates. It is running night and day, but is behind on orders. All the mills, they say, have sent out circulars advancing prices. Mittabell, Traitor & Co.'s mill is six weeks behind with orders and running double turn. The Globe Rolling Mill people report a similar state of affairs. They think the advance in prices is permanent and will soon go further. The leading furnace at Gore, in the Hocking Valley district, makes this report: "There is a scarcity of nearly all grades of iron in this district. Especially is this so as regards the higher grades of foundry iron and gray forge. There has been an advance sustained of \$1 per ton in some grades of iron since last report. There is no disposition shown by furnacemen to make any concessions or force sales. Scarcely any iron is being sold for future delivery, although consumers are disposed to place orders for the remainder of the year at ruling prices. Shall labor more than absorb the profits to accrue from the advanced prices is the all-absorbing question now."

From the Hanging Rock region, the Burgess Steel and Iron Works at Portsmouth report the busiest summer since 1873, with a working force of 175 to 200 men, and the mill running day and night. Their present orders will keep them behind for four months to come. Prices, they say, for agricultural and other steels, have not reached the reasonable views of manufacturers, yet a stiffening tendency is well marked. Fall buyers will hardly fare as well as those who have already made their contracts. At Ironton, in the Hanging Rock region, there is great activity.

Mr. E. McMillen, Superintendent of the Lawrence Iron Works, did not want the newspapers to give the iron trade too much of a notice; that would start all the mills in the country and reduce prices again. He preferred a steady, slow advance. There is no question, he said, that there was a solid advance of \$3 per ton on manufactured iron during the month of July. Pig-iron has gone up on an average about a dollar per ton in this locality. The demand is better than Mr. McMillen ever knew it. His firm are running a full set of hands and all of their finishing departments night and day constantly. A large part of their trade is in the South, and it is barely possible that the yellow fever may interfere.

A report from the New Albany district, at the Falls of the Ohio, says: "All the mills and foundries are full of orders, and are running a full force of employees. A profitable advance in the prices of merchant iron has been established, and the product of all the rolling mills has been increased to their full capacity." The railroad spike machines of the Ohio Falls Iron Works, which had lain idle for two years from low prices and lack of demand, have recently been put into operation, with large orders ahead, and a fair margin on the profit side. The rail mill, with large orders, will be obliged to "blow in" its puddling furnaces, on account of the scarcity of old rails and the increasing demands consequent upon the construction of new lines of road and the re-laying of the tracks of old lines, necessarily run down by the pressure of the panic of the five years preceding 1879. This will make an increased demand for, and an advance in, the price of pig iron, and it is believed that within the next three months every iron furnace in Indiana will be in full blast.

The Exportation of Machine-made Joinery.

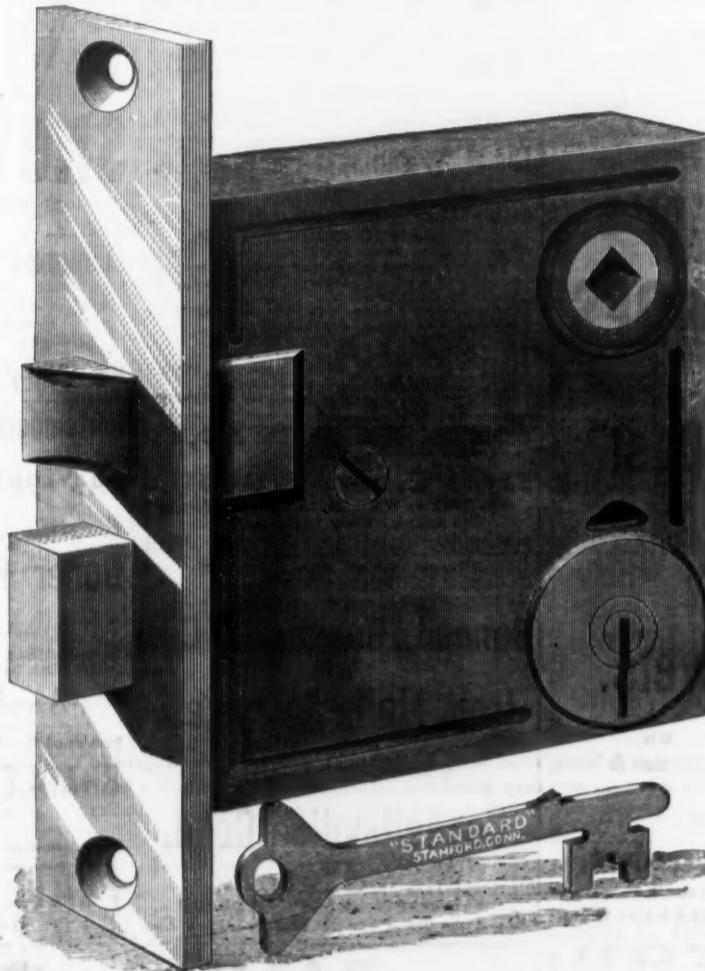
The Baltimore Sun describes a new American enterprise in the exportation of machine-made doors, window sashes, window blinds, and similar articles of joinery. The first shipment to England of this sort of goods took place in 1877, and although it was confined to doors for the cheaper class of houses, it at once met with a demand that justified the expectations of the shippers. A few window sashes and blinds were also sent; but they were chiefly intended for the British provinces, as Venetian blinds are not used in England. This new trade is, however, only in its infancy. For the first time, in 1877, some 10,000 doors and 624 pairs of sashes and blinds were shipped from New York to England, the greater part of which went thence to Australia and New Zealand. Since then California has supplied machine-made joinery to Australia, sending there 27,000 doors last month, as against 5000 sent direct from New York. But the transfer of the Australian demand for machine-made doors to California, and its consequent loss to the Eastern States, has been compensated for by an increase in the British demand for local use. The shipments of doors to England and Scotland in 1878 were about 45,000, as against 2800 in 1877. Up to June of the present year these shipments show a slight increase. It is a trade that is evidently capable of great extension, for all the pine lumber used in England is brought from Norway and the United States. It is a trade, too, that affects the English workman in two ways. For many years past there has been a large annual demand upon England from Australia and other British dependencies where wood of the proper kind is scarce, for the doors of warehouses and private dwellings, and to economize the cost of the doors so exported, they were made up into packing boxes, four doors placed longitudinally forming each box, the two ends being doors for small closets. As all the doors were hand-made, the trade of making them gave employment to quite a large number of English workmen, and the diversion of this trade to California, coupled with the demand that has sprung up in England itself for the machine doors of the Eastern States, must cause a good deal of anxiety among English joiners and carpenters in the present depressed condition of the labor market there.

Activity in the Western Iron Trade.

A correspondent, writing from Cincinnati under date of Aug. 1, says: Information received here from the different iron districts of the West and South, establishes the fact that a marked improvement has taken place in the iron trade during the past 60 days. Iron merchants, furnacemen and manufacturers, without a single exception, tell of a healthful advance in prices and a great increase in orders. Furnaces that have laid idle for years are being put in blast; rolling mills are running night and day in some localities; in others they are running 12 hours, and the men are paid one and one-fifth days' wages. In every department of iron industry a good feeling prevails. Dealers agree that the advance in prices is fully established. A leading Cincinnati firm report larger sales for July than for any preceding three months in the history of their business. They say there is a scarcity of iron in the market. Every manufacturer of railroad supplies has more orders than he can fill, and some of the rail mills are sold ahead for a year. Another encouraging feature is that they have now volunteer orders, while heretofore they have had to drum up custom. Still another good point is the number

Lord Derby has, as umpire of the arbitration between masters and men in the Durham coal trade, awarded the former a reduction of wages of 1 1/4 per cent. in addition to the former reduction. It is stated that 57,000 miners, including their families, are affected by this decision.

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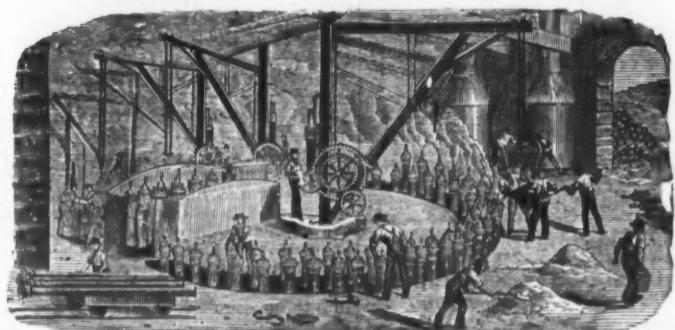
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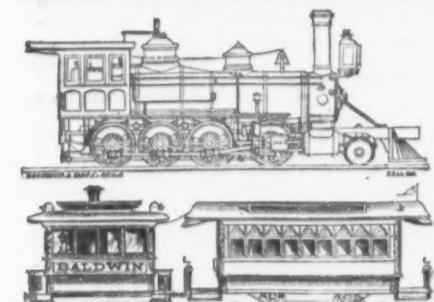
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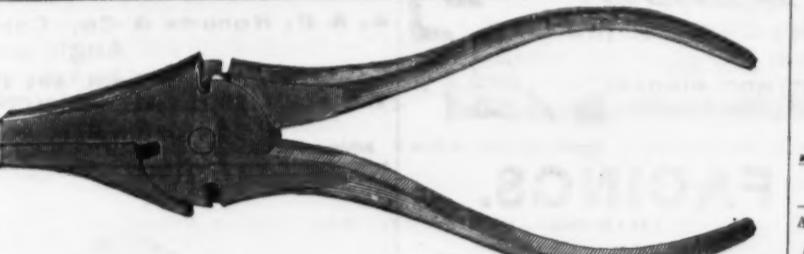
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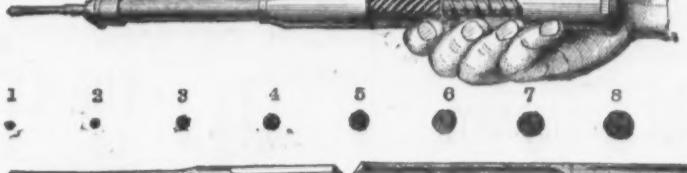
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**STANDARD
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WARRANTED.

FOR
STRENGTH
AND
DURABILITY
IT HAS
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GUARANTEED
IN
EVERY RESPECT.

Wrought Bar, Head
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Owing to the in-
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Popular Wrenches,

we are now manu-
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Nos. 5 6 7 8 9 10
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Liberal discounts to the Trade.

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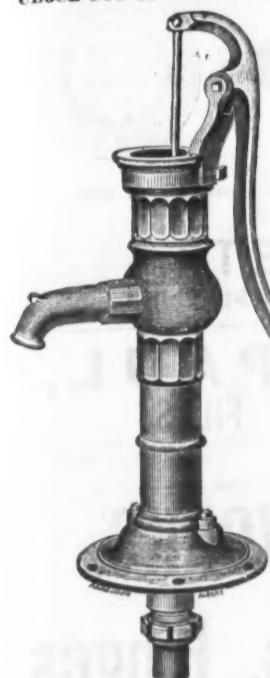
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MINERS' CANDLES.

superior to any other Light for Mining</p

THE LARGEST PUMP WORKS in the WORLD
OVER 800 DIFFERENT STYLES.
Pumps, Steam Pumps, Rotary Pumps,
Centrifugal Pumps, Piston Pumps,
for Tanners, Paper Mills, Fire Purposes, suitable for
all stations imaginable.

CLOSE-TOP CISTERNS PUMP, FIG. 101.



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France, 1878, being the highest award on
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Paris, 1867, Vienna, 1873, and Philadelphia,
1876, accompanied by the Report of Judges.

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Portable Fire Annihilator.
FIG. 279.



Aluminum and its Applications.

In an article contributed to the *Industrie blätter*, Mr. Clemens Winkler gives a history of the development of the art of working aluminum, as evidenced in the displays at the three international exhibitions at Paris. In 1855 aluminum was shown for the first time, at the Palais de l'Industrie, as a large bar, to which the extravagant name of "silver from clay" was given. In 1867 it appears again, but worked up, and betraying the manifold difficulties which had been overcome in its production on a large scale, its purification and its molding. It was exhibited in the form of castings, sheet wire, foil or finished goods, polished, engraved, soldered, and for the first time, and in varied forms, its most important alloy—aluminum bronze—was shown. After the lapse of almost another dozen years, the Paris Exhibition offered, in 1878, evidence of the maturity of the aluminum trade. The time when aluminum was worked up in single specimens, showing the future capabilities of the metal, has passed, and now it has become an article of current manufacture, having a regular supply and demand, and being in some regards commercially complete.

The fears entertained as to the future of aluminum is thus seen to have been unfounded. The manufacture of aluminum and of aluminum goods has certainly not grown as rapidly as was hoped. The lowest limit of the cost of manufacture was soon reached, and aluminum is still a product extracted only by a series of expensive operations from one of the cheapest and most common of raw materials. On the other hand it is steadily displacing for a variety of purposes other cheap metals, over which it is seen to have uncontested advantages. Its color and luster are pleasing, while its peculiar lightness fits it in an unrivaled manner for many purposes, both of science and luxury. This low density has to be taken into account when the price of aluminum is compared with that of other metals, since it occupies, weight for weight, three times the space of iron, copper, brass and nickel, and four times that of silver.

To France is due the credit of having been the first country to carry out Wöhler's process for the production of aluminum on a practical scale, and to have created the aluminum manufacture. France still seems to be the only country in which the manufacture is able to prosper.

The English manufacturer established at Washington, near Newcastle-on-Tyne, by Bell & Co., did not answer, and has been closed for about five years.

The German manufacturer set up at Berlin by Wirtz & Co., drooped before it was well started.

In France, the great chemical manufacturer of H. Merle & Co., in Salindres, near Alais, carries on the extraction of aluminum, and the Société Anonyme de l'Aluminium in Nanterre (Seine), works up the metal into the various forms demanded by commerce.

Both firms were represented at the Exhibition. Merle & Co. had a splendid display of bars of the metal, while the Société Anonyme exhibited samples of finished goods of all kinds, showing the progress made in its adaptation to various purposes.

But for this it would not have been possible to exhibit reels of brilliant wire, fine as human hair, or beautiful sheets of extraordinary ductility.

There were also exhibited stampings in aluminum—large medallions and pieces weighing exactly one gram, to show the lightness, compared with the bulk of the metal.

In one pan of a balance there were shown five large keys made of aluminum, which were counterpoised by a single iron key in the other pan.

The peculiar bluish-white luster of the metal also compared to advantage with the use of tin and zinc.

The beautiful objects made with great skill of aluminum bronze, and sold at very cheap rates, are more popular than those made in pure aluminum, which is relatively dearer.

Small articles of aluminum only are found to sell; among them may be especially named some pretty specimens of fine wire-work.

It is getting to be a common thing in Paris to make the frames for opera glasses and telescopes of aluminum.

Houses which cultivate this branch of manufacture with success are Clermont, Lemair and Fischer.

Still successful as is this application of aluminum, it is, perhaps, not the most favorable one.

The most rational use indicated for aluminum, by reason of its low specific gravity, is the making of beams for balances.

Aluminum bronze beams have been made for several years past; but, so far as lightness of metal is concerned, they have scarcely any advantage over brass.

Sartorius, of Göttingen, was the first who made light and unalterable beams of an alloy of aluminum with 4 per cent. of silver.

He has had but few imitators.

The Exhibition contained but one single balance the beam of which was made of pure aluminum.

This balance was exhibited by M. Collot; it carried 100 grammes, turning at 0.1 milligramme; its price was set at £80.

There are several reasons for the small amount of favor shown to aluminum by mathematical instrument makers and others.

First of all there is the price, then the methods of working it are not everywhere known;

and further, no one knows how to cast it.

Molten aluminum attacks the common earthen crucible, reduces silicon from it, and becomes gray and brittle.

This inconvenience is overcome by the use of lime crucibles, or by lining the earthy crucible with carbon or strongly burnt erythrolith. If any

one would take up the casting of aluminum as a current industrial operation, there is no doubt the metal would be more freely used in the finer branches of practical mechanics.

Besides aluminum bronze, a beautiful alloy,

which does not change color at a melting heat

and gives golden yellow castings, the alloys of aluminum with silver deserve attention.

They seem to possess admirable properties,

are exceedingly easy to work, and are practically unchangeable.

For these reasons it would seem desirable that attention should be given to their preparation and utilization.

A Great Trading Corporation on the West Coast.

Within a few days two large steam navigation companies, trading between the Columbia River and San Francisco, have been consolidated under a single management, with a view to systematizing and extending the enormous business of that section of the country. The organizations thus brought together are known as the Oregon Steamship Company, owning four new ocean steamers of about 8000 tons in the aggregate, running between San Francisco and Portland every five days—Mr. H. Villard, president; W. H. Starbuck, vice-president and manager—and the Oregon Steam Navigation Co., owning 28 steamers, 12 freight boats, 10 barges, floating warehouses, &c. The new title in "The Oregon Railway and Navigation Company," by whom the entire properties just described have been purchased, together with several locks, the Walla Walla and Columbia River Railroad, also the Dalles and Cillie Railroad, extending along the river valley. Mr. H. Villard, of New York city, is president, and Mr. W. H. Starbuck, manager. The general plan is to enlarge and improve the facilities for both land and water transportation, for this purpose building a superb steamship, intended to be superior to anything now afloat on the West Coast; also to finish without delay some 200 miles of railway on the Columbia River. A contract has just been given to John Roach & Son, at Chester, for a steamer 330 feet in length, 38 feet beam and 23 feet depth of hold, with accommodations for 250 first-class passengers, and a capacity for 2800 tons of freight. She will be finished by the last of February next. Nearly 60 miles of the railway are now in operation, and of the 200 miles in addition, a large part is already finished. To provide the capital required, a mortgage was executed July 13th, covering some \$6,000,000 of property, and the bonds offered were all promptly taken—bids being received for a considerable amount beyond. The Farmers' Loan and Trust Company, of New York, are the trustees of the mortgage and financial agents.

The new company claim to control the entire carrying trade of Oregon, Idaho and Washington Territory. This trade is growing rapidly. Last year, as we are informed, the net income was \$1,250,000, and present prospects are considered still more flattering. The company run boats up the Columbia 80 miles.

Car-Building in Canada.

The Montreal *Herald* says: Hitherto, with the exception of the cars built at the Grand Trunk workshops, no first-class passenger coaches, equal to those made in the United States, have been turned out of Canadian factories. That such cars were built at the Grand Trunk Works, however, proved conclusively that there existed no insurmountable obstacle in the way of manufacturing rolling stock of that description in Canada as well and as cheaply as elsewhere; yet, for some reason, the thing had not been done, and in the absence of a practical test, the question as to whether such cars could be made here or not was looked upon as problematical. At last, however, a Canadian car-builder would appear to have set the matter at rest, and there is now no longer any reason why our American cousins should monopolize this important branch of industry. This builder is Mr. James Crossen, proprietor of the Coburg Car Works, who has just completed, for the Montreal and Occidental Railway, two first-class passenger coaches, which for elegance, comfort and quality of workmanship and material, will compare favorably with those of the best American builders. One of these cars has been delivered to Mr. Scott, the general manager of the railway, and the visitors who made an inspection of it yesterday at Hochelaga, all expressed a high appreciation of its beauty and of the excellence of its design and finish. The car combines in itself all the improvements that go to make up a really first-class modern railway coach. Among the latest of these are the 42-inch wheel, which runs more smoothly than the old wheel, and which Mr. Davis, the mechanical superintendent of the railway, says will effect a reduction of 13 per cent. in "oilage" and 25 per cent. on the "bearings." These 42-inch wheels have not been in use hitherto in Canada except on the Grand Trunk. The car is provided, besides, with "standard" axles and axle boxes; the improved truck with iron sides; the vacuum brake, in which an iron cylinder with piston is advantageously substituted for the collapsible india-rubber cylinder, which latter is liable to work with some difficulty in very cold weather; also with wire gauze screens over the ventilators to keep out sparks and dust, and with the Miller platform and coupling. There are no end windows, as it is said that they admit more dust than any other opening in the car. The interior is handsomely finished in bird-eye maple, black walnut and rosewood, with gilt cornices and beading. The seats are provided with elliptic springs and concave arm-rests, which give more room, thus adding much to the comfort of the passengers. The car is lighted by three silver lamps, which are fed by wick burners and clockwork. These lamps give a brilliant light, and are non-explosive and odorless. There are three floors—two of pine and one of varnished oak. This triple floor is intended to deaden the sound, and adds much to the comfort of a trip by railway. But perhaps the most important improvement is the placing of the heater in a separate compartment. This compartment is lined with zinc, between which and the walls of the car is an air space, making the compartment fire-proof. In winter the temperature of the car is equalized by this arrangement, and in case of an accident the heater will be confined in the compartment, and will not become the source of imminent danger to the passengers that it is in an ordinary car.

This splendid car has cost the government only \$4750, which is less than an American car of the same class could be laid down for at Hochelaga. The purchase of two of these cars was made by Mr. Joly on the recommendation of Mr. Scott, who is well pleased with the manner in which the work has been executed.



(Pat. July 9th, 1878.)

In addition to the great variety of Iron and Brass Pumps, which we have been manufacturing for years, we are now making a full line of COPPER PUMPS under a patent granted July 9, 1878. The Barrel and Cone are drawn in one SEAMLESS pipe. Not only is it stronger, but it is also more durable, as heavy sizes are stronger and more durable, give a perfect valve seat, and require less repairs than those made in the old manner. The barrels are made with five hundred turns of wire, and are drawn to make a square bar. The Spout also is seamless. Dealers and Plumbers pronounce them far superior to any before in the market. The inside of the Pump and the working parts are polished and polished, giving a heavy surface for the contact with water. The handle is convenient and nickel plated. The Pumps are highly finished, neatly painted and decorated with gold leaf. They are a very convenient and ornamental article for a kitchen of the most costly residence. Discountable to the trade, 25 per cent. No charge for boxing. Freight paid to Boston or New York. Orders for all varieties of Pumps filled promptly. Please send for price list.

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Warehouse, 98 Chambers St., New York.

For sale in Boston by Walworth Mfg. Co., Hamblen & Matthews, Braman, Dow & Co., Eaton & Dana, Macomber, Bigelow & Dowse, M. C. Warren & Co., and Bogman & Vinal; in Providence by Belcher Bros., and in Worcester by C. Foster & Co., and White & Conant.

John Maxheimer,
Manufacturer of
Patented
Japanned, Tinned
Wire,
First and Second-
Class Brass
Bird Cages.

Wires on both classes fastened without solder.
The cheapest and most saleable in market.

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TACKLE BLOCKS.
Rope and Iron Strap of all kinds. Lig-
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GILBERT'S RIVAL ASH SIEVE,

Galvanized Twist Wire Netting,
THE UNION METALLIC CLOTHES LINE WIRE,
Warehouses, 273 Pearl St., New York.

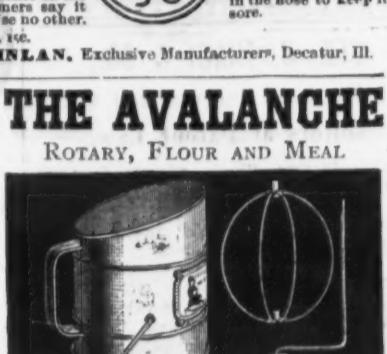
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C. L. LEWIS & CO., Agents, 273 Pearl St., New York.

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The Scotsman states that Thomas Bayley Potter, member of Parliament for Rochedale and secretary of the Cobden Club, is going to sail for this country. He will visit the principal "free-trade centers" in the Northern and Western States.

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Superior Hand-Cut
FILES AND RASPS,
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
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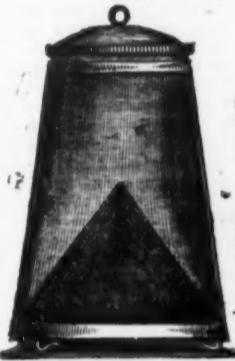
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Our Extra Hard Japan is unequalled. It has a finish equal to the finest English Coach Varnish, and hard as glass.

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Durability, Noiseless,
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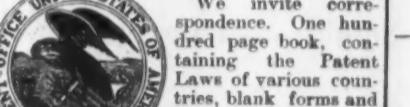
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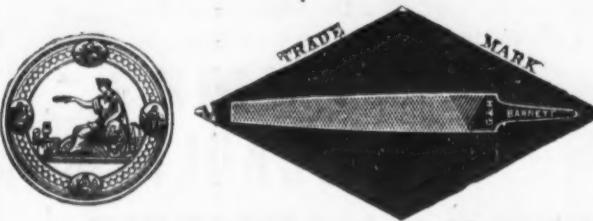
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Wood-Lined and Plain Zinc
STOVE BOARDS.

NEAT AND SUBSTANTIAL.

Will not warp or lose their shape. Easily

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For sale by Hardware and Stove Dealers.

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Sole Manufacturers of Mann's Tin-Rim Sieves.

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WIRE NAILS, TACKS, SHOE NAILS,

And Every Variety of Small Nails.

Offices & Factories at Taunton, Mass.

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where may be found a full assortment of Tacks, Brads, Wire Nails, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above-named goods made from sample to order.

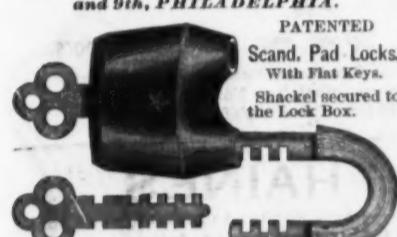
A SILVER MEDAL has been awarded above goods at the Paris Exposition, being the only medal awarded any American manufacturer of Tacks and Wire Nails.

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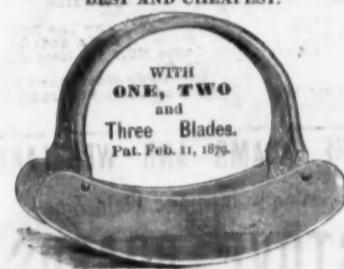
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THE IMPROVED
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is an invaluable implement for sprinkling flowers, &c. It is made in a very durable manner, handsomely nickel plated, and cannot easily get out of order. Also makers of Brass Greenhouse Sprinklers, fine mandrel-drawn Brass Tubes of all sizes and thickness. Tubes for sliding one within the other made to order. Send for circulars, &c.

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TACKLE BLOCKS
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Manufacturers of Waterman and Russel's
Patent Iron Strapped Blocks.
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ANSONIA CORRUGATED STOVE PLATFORM

Manufactured by the

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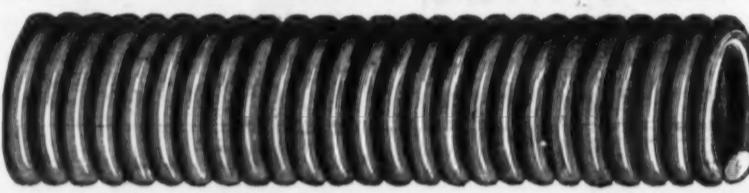


The Ansonia Corrugated Stove Platform with its heavy figured ogee border, is believed to be the best. Platform offered to the trade. As shown in the illustrated section herewith it requires no nailing to keep it in place or to prevent it from turning up at the edge; while the metal is of sufficient thickness to require no lining.

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The Ansonia Brass Spring Wire is made to combine the qualities of uniformity of temper, great power of resistance and recovery, toughness and accuracy of gauge. Each bundle of wire, before it leaves the works, is subjected to test in a machine which records the deflection and molecular displacement under transverse stress and torsion, and is especially adapted to making spiral springs for mowing and reaping machines, harvesters and for all purposes for which the highest grade of spring wire is required.

We do not make Springs.

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Solid Vulcanite EMERY WHEELS

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Rubber Back Square Packing

A
B
A

B
A
B

For Packing the Piston Rods & Valve Seats of Steam Engines & Pumps.

B represents that part of the packing which, when in use, is in contact with the Piston rod.

A is the elastic back, which keeps the part B against the rod with sufficient pressure to be steam tight, and yet creates but little friction.

This Packing is made in lengths of about 20 feet, and of all sizes from $\frac{1}{2}$ to 2 inches square.

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Punches.

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Communications by letter will receive prompt attention.

Jacks for greasing on Car Wheels or Crank Pins made to order.

American Competition.

The following suggestive article appears in the Bristol (England) *Times and Mirror*:

Where is this American competition to end? The Yankees are threatening to take the leather trade out of our hands now.

American locks are superseding those of Staffordshire. American apples are taking the place of those of Somersetshire and Devon in the dye works. American furniture is to be found in many forms in more houses than perhaps the inhabitants themselves are aware of, and many English sideboards next Christmas will probably groan under American barons of beef.

You cannot go into an ironmonger's shop without finding his cases full of American notions, locks which are lighter and cheaper than those of English make, and if not perhaps as substantial and well made, sufficiently well made for the purpose, and, to look at, natter than those which bear the mark of English makers.

Even the English agriculturists themselves are cultivating their fields, reaping and gathering their crops, when they can gather them at all, with implements of American invention and of American manufacture.

There is not a farm within the four seas, where machinery is in use at all, that American machinery is not to be found.

American mowing and reaping machines, American hay forks, everything that you need in harvest work, if you wish to economize labor, is to be found upon the farms of Norfolk, Northumberland and Gloucestershire, and everywhere the American implements seem to be preferred because they are lighter, handier and cheaper than the corresponding implements and machinery of English manufacture.

This ought not to be, and if England is not to be superseded in her own markets, it must not be.

The Yankees have many advantages over us in soil and climate, and so far as the productions of the land are concerned, in grain and meat especially, they may, with a rich and virgin soil, be able to produce, with less labor, more than we can produce with the aid of the costly artificial manures which we require to stimulate our soil; but to be superseded, as we are being superseded to-day in so many branches of industry, where intelligence and skill are the chief things concerned, implies something wrong in higher quarters.

In intelligence, in enterprise and energy, we have flattered ourselves till now that we could hold our own against all the world, and even now Lord Derby has been congratulating us that we shall still be able to compete with the American grazier, if we cannot possibly compete with the American wheat grower. But is that the case? The American beef and mutton is not perhaps equal, or anything like equal, in the fineness of its fiber or in taste, to the best grass-fed English beef and mutton; but it is said to be infinitely superior to the second and third-rate English beef and mutton that constitute the staple articles in the market; and if that is the case, the American grazier will monopolize the bulk of the trade in a few years, as the farmers of Illinois and Minnesota are monopolizing the trade of Mark Lane to-day.

The Atlantic will remain, whatever the Americans may do, and with the Atlantic and the enormous distances of a country which extends from the Atlantic to the Pacific Ocean and from the Canadian lakes to the Cape of Storms, the English farmer will always have a more substantial protection against American competition than a tariff.

But the English farmers, with costly labor, with clumsy machinery, with rates and taxes, with a gray sky, with hostile railway rates, and with a dozen other things against them, will one of these days find themselves beaten in their own markets, even with the Atlantic in their favor, if the Americans, with their restless ingenuity and enterprise, can eke out the favors of nature and do by cheap and effective machinery what we do by costly and cumbersome labor.

The Americans close their ports against English productions by a tariff which is one of the grossest violations of free-trade principles in the world; but even without this tariff, apparently, our manufacturers could not compete with their American rivals in many branches of trade which till now we thought belonged exclusively to ourselves by every right by which a trade can be held.

We keep open our ports, and plume ourselves upon the fact and upon the courage with which we adhere loyally to the principles of free trade. But if the Americans are producing better and cheaper articles than we can make ourselves—and that seems to be the case—we should be doing an injustice to ourselves by adopting a retaliatory tariff.

American productions are finding their way into English markets, not because our ports are open, but because the productions themselves are better and cheaper than our own, and as long as that is the case it is useless for our manufacturers to storm against free trade and open ports, or to talk of reciprocity.

The fault lies with themselves or with their workpeople, and the remedy, if it is to be found at all, must be found at home.

Adhering to free trade, however, as heroically as we may, there is no reason why railway companies should afford special facilities for American importers to glut English markets with their productions where English productions, if fairly dealt with, would stand at least an equal chance of holding their own; and that seems to be the case at present.

The Marquis of Huntly made a curiously-suggestive statement in the House of Lords a day or two ago as to the way in which several English railways are assisting American importers to push their productions in our markets, especially in the case of corn and meat.

The railways charge 25/ a ton for the conveyance of American meat from Liverpool to London, where in the case of English meat they charge 50/ a ton.

The charge for American meat from Glasgow to London is 60/ a ton. It is 70/ and 75/ a ton for fresh Scotch meat—70/ a ton if sent at the risk of the railway company.

The plea of the railway companies is that if they do not charge the American importers upon the lesser scale the ships, instead of landing their freights at Liverpool and Glasgow, will take them on to London, and that it is better for them to carry the meat upon

the lesser scale than not to carry it at all.

That is quite possible, of course, and perhaps we have no right to complain of the railway companies thinking more of their own interests than they think of the English and Scottish graziers and stock masters, but the effect of this policy of the railways is obvious enough.

It is equivalent in the case of Liverpool to a premium of 25/ a ton upon American meat against English meat, and that in the case of large quantities is a material consideration.

It is enough probably to turn the scale in favor of American meat in the case of inferior qualities.

American corn is sent from London over all the lines of English railways at one-third less charge than English corn, and thus, what with meat on one hand and corn on the other, the English farmer is being everywhere supplanted.

English meat has many things to recommend it to Englishmen independently of patriotic considerations; but there are many people who, with all their patriotism and love of English roast beef, have to think of price, and the price of English meat and English wheat is raised against the consumer very unnecessarily by the policy of the railway companies.

It is hard that the English farmer should be pushed to the wall by his American rivals; but the hardship is intensified if his American rivals are to have their paths smoothed in every possible way for them, and if English railway companies are to charge English farmers specially high rates because they are Englishmen. Yet that is what they are doing at present, and it is high time that the system was put a stop to.

This is a case for the Railway Commissioners, and we are glad to see that, in the opinion of Lord Henniker and the Lord President of the Council, the conduct of the railway companies is a distinct and palpable violation of the Railway and Canal Traffic Act.

The railway companies themselves profess to think that it is not, and the question, of course, involving as it does the construction of an act of Parliament, is a question for a judicial tribunal to decide.

But the Americans themselves would make short work with any railway company which carried English beef and English wheat over their lines at 50 per cent less than that it carried American meat and American wheat, and we must protect ourselves.

Let the Americans have fair play by all means. We ask for no favor for English producers; but we protest against English railway companies encouraging the importation of American beef and American wheat by a system of bounties which is quite as unfair in its operation as the system of bounties by which France, Belgium and Holland are forcing their beet-root sugar into our market, ruining the sugar plantations of the West Indies, and throwing hundreds of English workmen out of employment.

The Iron Industry of Berks County, Pennsylvania.

Mr. Alfred H. Fogely, County Commissioners' clerk, has prepared for the Bureau of Industrial Statistics, of the Department of Internal Affairs, Harrisburg, a list of iron works located in Berks County, Pa., which he has forwarded to Harrisburg.

The list is as follows: Union Furnace, Windsor township, Daniel B. Fisher, Leesport; Maidencreek Iron Company (furnace), Spang, Erb & Co., Lenhartsville; Moselem Iron Company (furnace), Leibhardt, McDowell & Co.; Leesport Iron Company (furnace), Lew Kaufman, Supt.; Temple Iron Company (furnace not in operation); Lyons Furnace, Mr. Garretson; Kutztown and Tipton furnaces, William M. Kaufman & Co.; Oley Furnace, William H. Clymer & Co.; Temple Furnace (not in operation); Birdsboro furnaces, E. & G. Brooke; Monocacy Furnace (receiver appointed); Hopewell Furnace, Clingan estate; Joanna Furnace, L. Heber Smith; Henry Clay Furnace, H. S. Eckert & Bro., Reading; Keystone Furnaces, Bushong & Bro., Reading; Reading Iron Works—furnaces, rolling mill, nail mill, tubo works, plate mill, Scott foundry, machine shop, sheet mill, steam forge; Pine Iron Works, rolling mill, J. L. Bailey & Co.; Birdsboro Rolling Mill, E. & G. Brooke; Gibraltar Forge and Rolling Mill Simon Seyfert; Do Well Forge, Isaac Moore, Gibraltar; Charming Forge, W. & B. F. Taylor, Womelsdorf; Douglassville Forge, B. F. Morrett & Co., Douglassville; Keystone Forge and Rolling Mill, J. V. Craig & Co., Reading; Seyfert's forges, Wm. H. Seyfert, lessee, near Shartlesville; McIlvain's forge and rolling mill, William McIlvain & Sons, Reading; Union Boiler Works, Francis Joseph Ober; A. C. Greth, machine and repair shops; Reading Brass Works, Douglass & Connard; West Reading Boiler Works, Sterling, Weidner & Co.; Reading Industrial Machine and Brass Works, Miller, Printz & Co.; Reading Hardware Company, two foundries; Franklin Foundry and Machine Shops, Adam Johnston & Son; P. & R. Co.'s boiler shop, machine shop, foundry, car shop, rolling mill and steam forge; West Reading Foundry and Machine Shop, Meller & Co.; Rick Brothers' foundry and machine shop; foundry of Penn Hardware Company, C. R. Heizmann & Bro.; J. H. Cheetham's foundry and machine shop; stove works of Orr, Painter & Co.; Reading Bolt and Nut Works, J. H. Sternberg; Union Foundry, Kepelman & Stols; Wm. H. Robinson's foundry and machine shop, Reading; Fleetwood Foundry and Machine Shop, Schaeffer, Merkell & Co.; Bernville Foundry, John Hetrich; Daniel Schlegel's machine shop, Boyertown; Monroe Weaver's machine shop, Boyertown; Moyer's forge, Morgan Althouse, Exeter; Exeter Forge, Isaac McHose; H. C. Se

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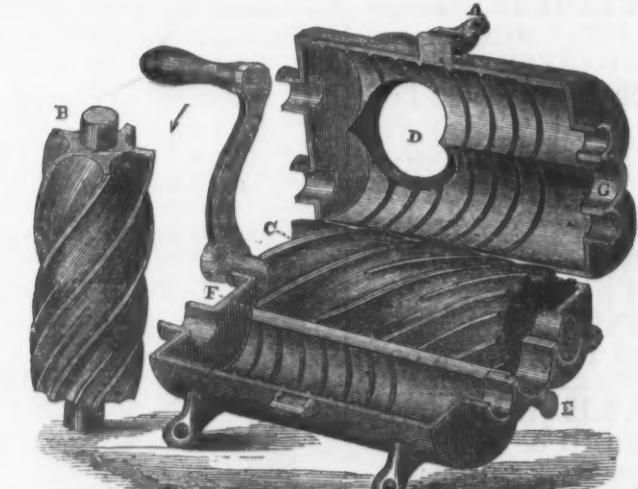
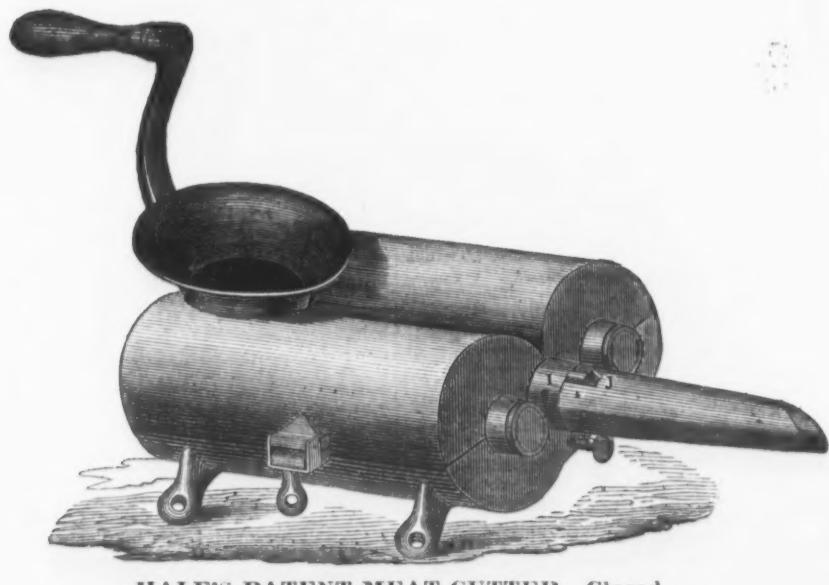
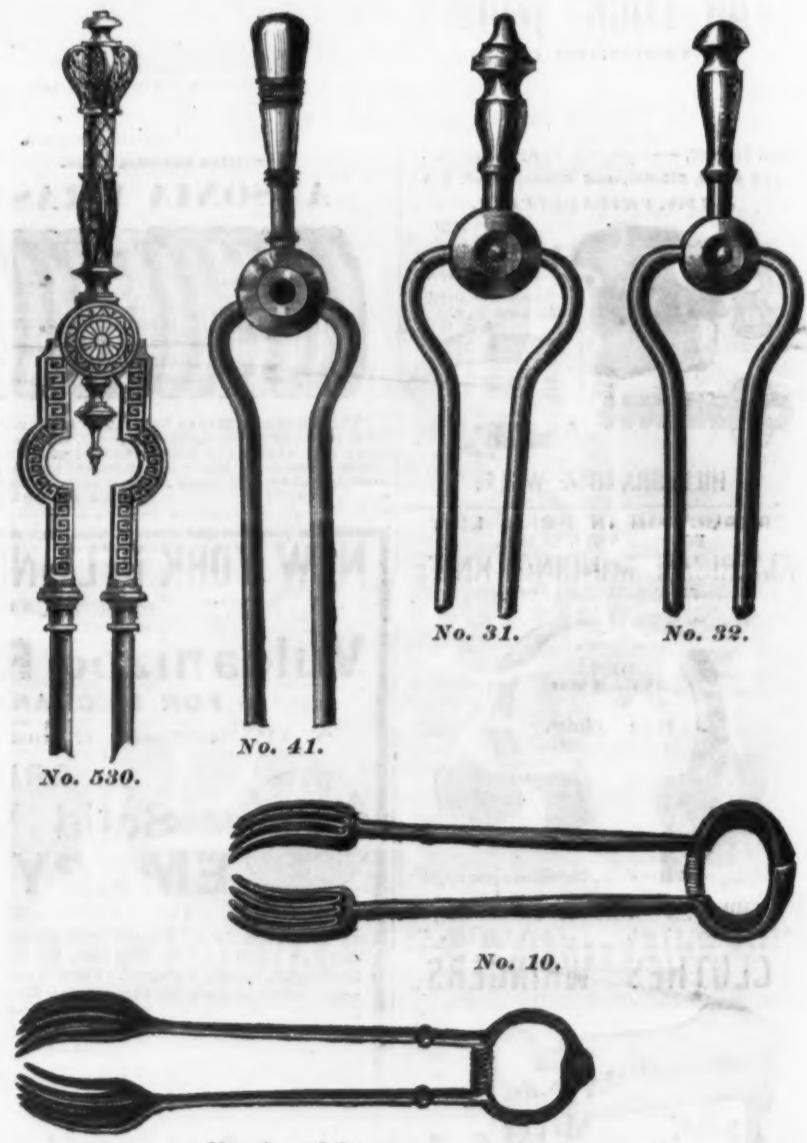
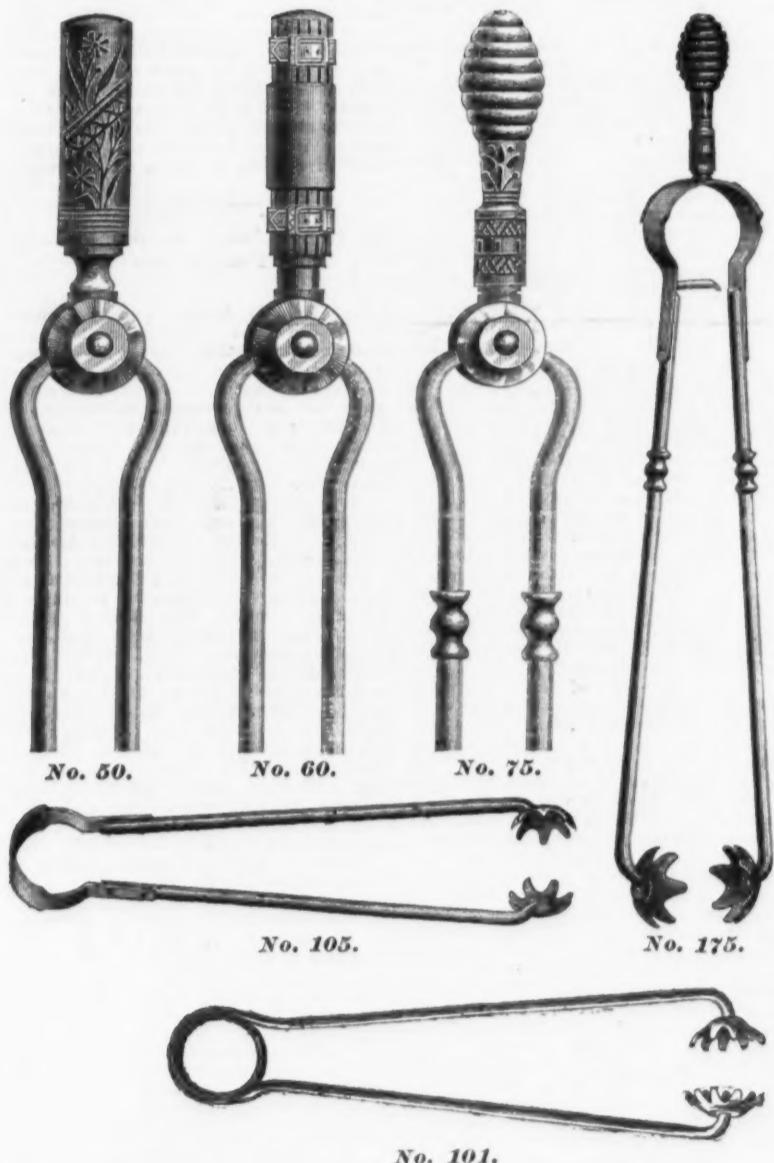
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Coal Tongs,**

JAPANNED AND POLISHED STEEL.

**Hale's Patent Meat Cutters, Butcher's Meat Cutters, Waterman's
Patent Cast Iron Bake Pans, &c., &c.**



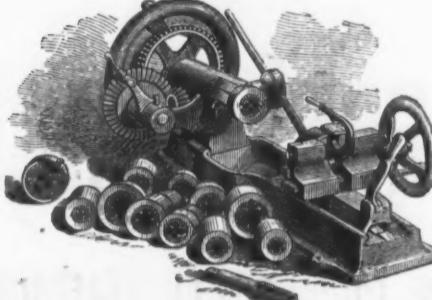
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Lightning Screw-Cutting Machinery and Tools.

Bolt Cutters, hand or power.
Screw Plates, Taps, Dies and Reamers.
Green River Drills, hand or power, with Screw-cutting attachment.
Tire Benders, Upsetters, Measuring Wheels, Horse Shoers' Vises, &c., &c., &c.

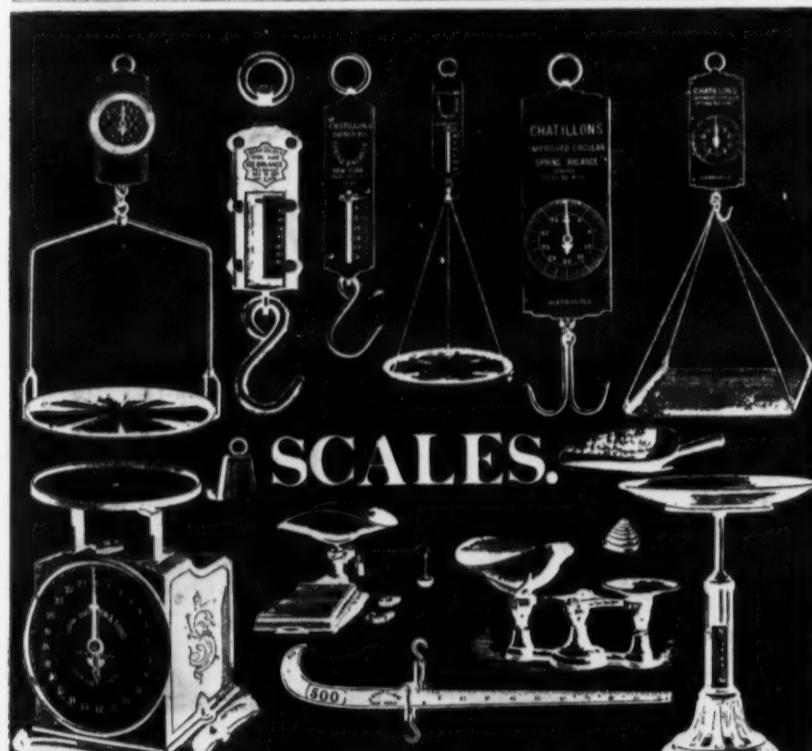


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E. & G. BROOKE'S "Anchor Brand" Nails, Brads, Spikes, &c.
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FRANCE'S Shutter Holders.
Anti-Window Rattlers, Brass and Nickel-Plated.
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AMERICAN SHEAR CO.'S Shears and Scissors.
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Also a large line of Heavy and Shelf Hardware.



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Square & Hexagon Nuts,
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BOLTS,
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ALWAYS ASK FOR

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THE MOST POPULAR PENS IN USE.

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Works, Camden, N. J.

New York.

WESTON DYNAMO-ELECTRIC MACHINE

NICKEL.

The rapid increase in the use of Nickel-Plating owing to the introduction of the Weston Machine and the very low price of nickel material, enables us to give greatly reduced estimates for complete outfitts.

We are furnishing outfitts specially adapted for Stove Work, giving a pure white deposit on plain or polished surfaces.

Outfitts complete, with Dynamo-Electric Machine, Tanks, Anodes, Solution, &c., &c., \$250.

We beg to refer to the following Stove Manufacturers among 500 other houses using the Weston Machine: Richardson & Boynton, S. S. Jewett & Co., Fuller, Warren & Co., Perry & Co., Detroit Stove Works, Michigan Stove Co., Co-operative Stove Co., E. & C. Gurney, Hamilton & Toronto, and many others.

IMPROVEMENTS.

We call attention to improvements of the Weston Machine, in which Automatic Switches are used to prevent the occurrence of short-circuits, and to grant or purchase of all forms of Automatic Switches for Plating Machines. The adoption of these machines will certainly lead to great loss to parties purchasing or using them.

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Nickel Plating.

EDWARD CARTER,

22 to 40 Spring Avenue, TROY, N. Y.

Stove Work a Specialty.

One of the Best Selling Inventions in the Market.

Dubois' Patent

RULE GAUGE.



Having introduced my Rule Gauge, and finding it meets the wants of Carpenters and Mechanics, and is appreciated by them, thousands having already come into use all over the country, I am now prepared to supply the trade at a liberal discount.

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and

Spring Wire.

Phosphor-Bronze.

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The Phosphor-Bronze Smelting Co., Limited,

2038 Washington Avenue, Philadelphia.

A Burning Coal Mine.

The Pottsville Miners' Journal tells the following interesting story of the burning coal seam in Schuylkill County:

The vein that is burning is called the "Jugular," and the surface crop was first worked in 1833 by Lewis E. Dougherty, at a place called Coal Castle, 1 1/2 miles west of what is now known as Mount Laffey. The coal taken out was of excellent quality and the mine very productive. Where a drift is worked above water level it is the custom to keep a huge grate filled with burning coal just inside the mouth, to prevent the water in the gutters from freezing. Such a grate was in operation in the upper drift of Mr. Dougherty's mine in the winter of 1835. One Saturday night the grate was filled with an unusually large quantity of coal, and the miners went to their homes. On the following Monday morning when the mine was visited, it was found to be filled with flames. It is supposed that the fire on the grate became communicated to the timbers, and moving along the upper drift was, by means of an air-hole, carried into the lower drift. At any rate, the coal in both drifts was on fire when the men came to work on Monday morning, and two of the miners recklessly went in to save their tools and never returned.

Efforts were made to extinguish the fire, but, after working for several weeks, Mr. Dougherty gave up all hopes, and, abandoning the place, opened another colliery about half a mile west of it. During the winter of 1836-7, Mr. John McGinnis, of Pottsville, heard of the large body of coal that lay near the abandoned mine, and concluded that some of it could be got out without reaching the fire. He put in a slope on the east side of the vein and below the water level. The work, however, progressed slowly, and owing to the heavy masses of rock encountered was very expensive. He was finally rewarded by striking the "Jugular" vein at a point where there was a deposit of coal so thick that two or three miners could keep the breaker going, and although it was worked for months, they never succeeded in getting through it. The coal proved to be first class, and 400 yards of gangway had been driven when the miners began to complain of excessive heat, and then Mr. McGinnis knew that they were approaching the fire in the mine Dougherty had abandoned. This was about a year after the slope had been started, and Mr. McGinnis saw that it would be necessary to open an air-hole. This work began at once, but, after driving 20 or 30 yards, the heat became so intense that the workmen were almost suffocated and many of them refused to continue. By paying double wages, however, a number of men were found willing to work in the air-hole; some idea of the intense heat may be had when it is stated that the men worked perfectly naked, and were relieved every 10 minutes. After the air-hole had been opened about 50 yards the heat became unbearable, and the men fainted when exposed to it a minute or two. Seeing that it was impossible to complete the air-hole, work in it was given up, and at a fortunate time, for it was afterward discovered that if the hole had been carried up a few yards further it would have struck the water on the upper level and drowned everyone in the mine. About this time the miners noticed that when a shot was fired, and the coal came rolling down in huge masses, it was so warm that it could not be comfortably handled. Every day the miners expected to see the fire break out, and at last on coming to work one morning they found the gangway filled with smoke and flames. As this was expected to happen sooner or later, preparations had been made to extinguish the fire, and the mine was soon filled with water. This treatment had the desired effect, and when the water was pumped out work was resumed.

From this time forward it was almost a continual fight with fire, and no less than eight times was the colliery filled with water and pumped dry again. The ninth time the colliery was filled with water the machinery got out of order and the pump refused to work. As Mr. McGinnis had sunk all his capital and could not raise money enough to purchase new machinery, the mine was abandoned in the winter of 1859.

The fire continued to burn until the barriers between the mine were consumed and the timbers in Mr. McGinnis' mine gradually rotted away, and finally the slope caved in. From that time until now the fire has continued without interruption, and the coal has been consumed for half a mile in every direction. The ground has caved in in many places, leaving great chasms that vary from 50 to 100 feet in depth. Travel over the burned district is exceedingly dangerous to any one not familiar with the country, for in many places great holes are only covered by a shell of burned earth 3 or 4 feet thick.

Mr. McGinnis states that even as familiar as he is with the locality, he came very near losing his life there a few years ago by falling through the crust. He was crossing a portion of the burnt earth when he felt the earth giving way under his feet, and on starting to run for firmer ground he sank up to his armpits in dry ashes and burned earth. Fortunately he managed, with the assistance of a friend, to extricate himself and reach solid ground without injury. Inhabitants of the region never attempt to cross over the burning vein at night.

The only external evidence of the great conflagration that is going on underneath the ground at that point is the total absence of vegetable life. Stones on the surface of the ground are so hot that they cannot be held, and snow is melted as fast as it falls.

During rainy weather the surrounding country is enveloped in dense clouds of fog that rise from the overheated earth. The fire has now burned across the rock and into a dirt vein, or vein of soft coal, where it may last for many years. During the early part of Mr. McGinnis' connection with the mine, it was noticed that the water oozing into it from the levels above had the effect of destroying the miners' shoes as soon as they came in contact with it. The water was not unpleasantly warm, and the men found that if a wound was washed with it a speedy cure followed. The curative qualities of

this water soon became known, and hundreds of people flocked to Coal Castle during the summer of 1858 to test its merit. Remarkable cures of rheumatism, scrofula and other diseases are said to have been made, and, consequently, the water attracted a great deal of attention all over the country, and hundreds of barrels of it were shipped to Philadelphia, New York, Boston and Baltimore. A physician established himself near the burning mine, bath-houses were erected, and for several months the place was filled with strangers. After the mine was abandoned, however, and left half full of water, it was difficult to obtain the mineral water that performed the cures, and the place began to lose its reputation, the doctor left for parts unknown, the shipment of water ceased, and one by one the visitors departed. The water is still held in high regard by many people, being strongly impregnated with alkaline earths. The property is now owned by the Philadelphia and Reading Coal and Iron Company.

The Harlem River Canal.

The work on the proposed improvement of the Harlem River by widening and deepening it from the Hudson to the East River has not yet been commenced, because the national government cannot procure the right of way. Four hundred thousand dollars has been appropriated by Congress for the work, with the proviso that nothing shall be paid for the right of way. Notwithstanding the vast improvement to commerce that would follow the opening of a channel for ships from river to river, and the great personal benefit to property owners, it would seem that the procuring of the right of way is by far the hardest portion of the improvement to be accomplished. For 60 years the improvement of the Harlem River has been thought of, and occasionally some action would be taken, never, however, resulting in anything beyond the drawing of plans and the making of estimates. To-day the river remains the little, shallow, dirty stream it was one hundred years ago. In 1827 a company was incorporated to construct a canal from the Spuyten Duyvil Creek to the Harlem, and although the time allowed in the act of incorporation was extended for several years, nothing was done beyond making the surveys. Since then State and municipal charters have been granted from time to time with absolutely no result, and it was not until a few years ago that the matter was brought prominently before the government with show of success. Government surveys were made under the direction of General Newton, and the fact demonstrated that a through connection, like the one proposed by him, could be made self-sustaining. Four lines were discussed, of which two only are now considered feasible by General Newton as being the least costly. The first is carried through Sherman's Creek and Tubby Hook. This was the shortest possible route, being only 4.64 miles from High Bridge to the Hudson. The second goes through Dykeman's Meadows and across Spuyten Duyvil Creek, a distance of 5.87 miles. The first, or Sherman's Creek and Tubby Hook route, is the shortest, but it has so many physical disadvantages, such as a large amount of rock cutting, &c., that it has been set aside in favor of the other and longer route. This latter runs almost at right angles to the Harlem River just below Kingsbridge. Its course lies through a very low district known as Dykeman's Meadows, until it reaches the head of Spuyten Duyvil Creek, which it crosses. Again some light cutting will be needed to cross the narrow point of land that turns the course of the stream southward for a short distance. Then the creek itself will be utilized to its entrance into the Hudson River. The other two routes proposed favored the following of the natural course of the Harlem River and Spuyten Duyvil Creek, and the taking advantage of a valley that leads from Sherman's to Spuyten Duyvil creeks respectively. These routes have also been abandoned. The work will cost about \$2,100,000 between the Third-avenue bridge and the mouth of the Spuyten Duyvil Creek. In order to get the rocks out of the river below the Third-avenue bridge, it will cost about \$600,000 more, making the total cost about \$2,700,000. The additional expense of the Tubby Hook route would be about \$1,000,000.

The State Legislature in May made amendments to the act of 1876, which provided for the granting of the right of way to the United States, by establishing a court with power to appraise and fix the compensation for and assessments on the real estate to pay the awards and costs.

Closing Up the Paris Exhibition

Business.—Commissioner-General McCormick still retains an office at the State Department for the purpose of closing up his official business in connection with the Paris Exposition. None of the silver and bronze medals awarded to American exhibitors have yet been received. Of the 20 commissioners appointed to prepare for publication reports upon subjects specially assigned to them, only 12 have thus far performed their duties. These gentlemen were each awarded \$200 to prepare a report. Mr. McCormick expects to close up his business as Commissioner-General in November next, and will present his report to Congress in December. The commissioners who have not yet prepared their reports should, therefore, begin work upon them at once, in order that they may be received in time for publication in the volumes describing the American exhibits. That a favorable impression was made abroad by the American exhibit is shown by the fact that letters are received every week by Mr. McCormick from various parts of Europe, asking for information about various articles and commodities, their prices, and the addresses of the persons who had them on exhibition. To furnish answers to these inquiries copies nearly all the time of the one clerk who is now on duty with the Commissioner-General. It is suggested that American manufacturers and others having commodities which would sell in European markets, might send illustrated catalogues to American consuls for distribution, printed in the several languages spoken in Europe.

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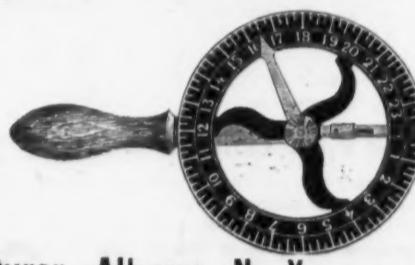
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INDUSTRIAL ITEMS.

MAINE.

It is proposed to establish a glass factory at Brunswick, Henry Ragot, a native of France, being the projector.

The Lewiston Machine Company have 150 men at work, and are driven with orders.

The Saco Water Power Machine Shop is constructing four new annealing furnaces.

MASSACHUSETTS.

The glass works in Sandwich, which have been idle for three or four weeks past have gone into operation. The tuck factory now runs 50 hours a week instead of 32, as formerly.

CONNECTICUT.

The Yale Lock Co. of Stamford have just supplied to some Chicago parties a 10-ton traveling crane. The crane is 55 feet long, weighs 25,000 pounds, and travels 125 feet, and can be operated with ease by one man. The design is entirely new. One novel feature in its working is that it is operated by power, communicated through wire cable, from a stationary steam engine.

A New Haven establishment manufactured 22,424,772 fish hooks last year.

There are 58 corporations doing business in Bridgeport, and they represent an aggregate capital of nearly \$6,000,000. These are chiefly engaged in manufacturing, embracing 50 different lines of business, and of the capital involved about \$2,250,000 is in the manufacture of sewing machines.

A new company has been organized to manufacture pins at some point in the Naugatuck Valley. Capital stock to the amount of \$75,000 has been taken by Birmingham, Huntingdon and Ansonia already.

NEW YORK.

Work has been resumed at G. H. Phillips & Co.'s stove foundry at Troy.

The Mohawk and Hudson Manufacturing Co., of Waterford, have recently built and shipped to the hemp region in Kentucky, a hemp softening machine, which is believed to be the largest and heaviest in the country.

It has two fluted rolls. The lower one is 12 inches in diameter and 6 feet long; the upper one 24 inches by 6 feet.

The lower one is driven by gearing from the back shaft, and in turn it drives the upper.

The shafts are 6 inches in diameter. The upper roll and shaft weighed about 8500 lbs., and the complete machine about 15,000.

Other hemp softening machines have been built at these works, but none as large and heavy as this.

PENNSYLVANIA.

The old Portage Iron Works, at Duncansville, Blair County, have been leased by the Hollidaysburg Iron and Nail Company for the manufacture of muck bar. The product will be finished at Hollidaysburg. The mill was to have been running the 5th or 6th. There are eight furnaces in the mill.

The production of the Monocacy Furnace for the first week of its blast was 171 tons of No. 2 iron, and they have orders for as much as they can make for the next two months.

The blowing in of the Merion Furnace, under the direction of Mr. Joseph E. Throop, has been very successful, and has given an impetus to the industries of West Conshohocken. The furnace, which has been idle for over two years, has been thoroughly repaired and much improved. Its sister furnace, the brand new Elizabeth, standing beside it and owned by the same firm (J. B. Moorhead & Co.), may be blown in at no distant day, should the iron trade continue to improve as it has been doing. Only the best of stock is used at this furnace, and it is the purpose of the firm to make superior grades of iron.

The Pennsylvania Railroad Company have just given an order for 700 car wheels, to be made as fast as possible.

The East Penn Furnaces, at Lyons Station, owned by the Philadelphia and Reading Coal and Iron Company, have been leased by S. Garretson, of Pottsville.

These furnaces are now being thoroughly repaired and renovated from top to bottom, adopting Weimer's patent charger and sealed top, instead of the old style tunnel head, and its improved dam, water jacket and tuyeres.

Both stacks will be ready for blast early in August.

PITTSBURGH AND VICINITY.

At the works of the United States Iron and Tin Plate Company, Demarest Station, all departments, with the exception of the tinning rooms, are running steadily to the utmost of their capacity.

The demand for the fine sheet iron produced at these works is so great that the company can only accept about half of the orders that are offered them.

At these works everything looks busy and cheerful until the idle and gloomy-looking tin-house is reached. Many thousands of dollars are invested in these buildings and the machinery contained therein, but the misplacing of a comma in the tariff law makes the investment unproductive.

This is not all; the misconception of the law by Secretary Fessenden has cost this country an annual loss of several millions of dollars in revenue. Indeed, it is about time that the appeals of our tin-plate pioneers find recognition.

The Pittsburgh Hinge Works are at present running single turn on barbed fence wire. This company will employ about 200 chain-makers the first of the present month.

The saw works of Messrs. Emerson, Smith & Co., at Beaver Falls, are running full time, with orders ahead. They have just received another from James Beard & Co., of Alcona, Mich., for one of their solid plate circular saws, 74 inches in diameter.

This will be the largest saw ever turned out by the firm, and probably the largest one ever made for use.

It will cut 7 inches at each revolution, or at the rate of 380 feet per minute. About four months ago Messrs. Beard & Co. ordered one of their 72-inch lumberman's clipper saws, which is giving perfect satisfaction, hence this latter order.

It will be remembered that Messrs. Emerson, Smith & Co. are largely engaged in the manufacture of band saws, and have furnished a number of them—54 feet long, 8 inches wide—for shipment to California, to be used in sawing the great trees of Humboldt County.

An additional factory and furnace is being erected to the extensive window glass works of Cunningham & Co., South Side.

The building will be completed in a week or two.

The Pennsylvania Lead Company, of this city, takes a very large quantity of the "base bullion" from the smelting furnaces of Colorado. Their daily receipts of this material and their outlay of money therefor, as well as their freight bills on the bullion, are very large.

The coal that went out of Pittsburgh on the rise of last week, aggregating about 8,250,000 bushels, would require over 26,000 cars for its transportation. There is some advantage in water communication after all.

McKnight's old mill at the foot of Fifteenth Street, South Side, has been leased by Messrs. Lewis, Oliver & Phillips, and was to be put in operation on Tuesday.

Chess, Smythe & Co.'s mill, which has been running single turn, will run double turn for some time to come.

The Olive Stove Works, at Rochester, which have been idle for repairs, are again in operation, with large orders ahead. The prospects are good for a steady run until December.

The Beaver Falls Steel Works are making some improvements that will add to their facilities for manufacturing and shipping. Several stands of new rolls are being placed in the mill. They are also erecting a stone warehouse on the P. & L. E. R. R., which passes their works.

After long idleness, work has been resumed at the old Wharton Mill, on the South Side. The National Tube Works are operating it.

OHIO.

Owing to the superior quality of her iron ores, the Pine Grove Furnace has always made iron on less charcoal than Kentucky furnaces, her best yearly work being 119 bushels of charcoal to the ton of iron, which is over 20 bushels better work than that of the best Kentucky charcoal furnace.—*Greenup Independent*.

TENNESSEE.

The following is a statement of the working for July at the Sewanee Mines, Tracy City, Tenn.:

	Cars.	Bushels.
Coal.....	435	126,888
Coke.....	404	217,014
Total.....	839	343,902

This shows a decrease of 227 bushels coal and an increase of 129,079 bushels coke, as compared with July, 1878. All the coke produced is consumed in the Chattanooga district, showing an increase in the use of coke for the smelting of ores in the South.

The Chattanooga Times says: As an indication of the improvement in business, the agent for the sale of the foundry irons of the Rising Fawn and Chattanooga furnaces in the Southern States, informs us that every pound of foundry metal on hand has been shipped away. He received orders in one day last week for over 100 tons for shipment to Southern foundries. The Rising Fawn brand is especially a favorite with the founders, and is becoming more popular every day.

In common with the other furnaces of the district, the Rising Fawn and Chattanooga have advanced their prices; yet, notwithstanding the advance, are obliged to decline some orders, having already booked all they care about engaging at present.

KENTUCKY.

The Norton Furnace is averaging about 65 tons daily of No. 1 Gray Forge and Mottled pig, using one-third coke and two-thirds of their own coal. The mixture averages 54 per cent. in the furnace.

The Princess Furnace and 6000 acres of land were sold at the Catlettsburg court house, on July 25, for \$35,100, Mr. Tom Means, of Hanging Rock, being the purchaser.

ILLINOIS.

We condense the following Chicago notes from the *Western Manufacturer*: The Furst & Bradley Manufacturing Company have been compelled by the large increase in their business to increase their facilities and the capacity of their works. They are erecting an additional building of brick, 40 feet front on Fulton street, by 80 feet deep, 4 stories above a high basement. The new Sixteenth street white lead works of Hugh McElroy & Co., are ready for operation, and the work of corrodin will soon be in full blast. The Northwestern Horse Nail Company are running with full force on full time, with a demand always equal to the capacity of their works. The Brown & Van Arsdale Manufacturing Company, manufacturers of wagon skeins, land rollers, &c., are running full force on full time, and turning out large quantities of their special products.

The strike at Jos. H. Brown & Co.'s Iron and Steel Works, Chicago, is at an end.

WISCONSIN.

The rail and merchant mill at Bay View is running full. Indeed, the entire extensive works of the North Chicago Rolling Mill Company at this place, as well as at Chicago, have been running double turn the whole year, with large orders ahead. This company employs in all about 4000 men.

INDIANA.

All the industries of New Albany are reported in a flourishing condition. The DePauw Glass Works will probably keep their 800 workmen busy through the season. The Rail Mill Company's prospects for plenty of work during the next six months are very good. The Ohio Falls Iron Works Company are running night and day to supply the demand for manufactured iron, and the Forge Works are kept busily employed.

Activity in the Locomotive Works.—The following notes will prove that the present and prospective improvement in the business of our railways is telling favorably on the locomotive works of the country: At the Brooks Locomotive Works, in Dunkirk, N. Y., 18 locomotives are to be finished by October 1. Orders for 38 locomotives have been received by the Baldwin Locomotive Works in Philadelphia. The New York and Sea Beach Railroad wants 3, the Chicago, Burlington and Quincy have ordered 15, the Chicago and Alton 14, the Denver and Rio Grande 6, and several are wanted for South America. Four passenger engines, with 17 by 24-inch cylinders, are being built in the Pittsburgh, Fort Wayne and Chicago shops at Fort Wayne, Ind.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, August 7, 1879.

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The idea seems at last to have struck Hon. Hendricks B. Wright, chairman of the Congressional Labor Committee, that there is not so much depression after all. He is reported as being very much surprised at the results of his investigations at Chicago. There was no evidence of depression, but, on the contrary, he found a state of things the reverse of this, such as, to use his own words, "A community of men engaged in mammoth manufacturing and mercantile pursuits, who pay cash for what they buy and require cash for what they make or sell, and who declare that there is an abundance of money with which to carry on their business, and he failed to find things as he confidently looked for among them—the city full of starving mechanics and workmen unable to find employment." And yet he hopefully turned his face Westward. If Mr. Wright will only be wise he will conclude to let things alone. There are a good

many men in this country who fervently wish that Congress met but once a century, and that this century's session had ended last year. The number will be increased if the business interests of the country are not let alone.

The Thomas Process and its Critics.

As might have been expected, the excitement over the announcement that success had crowned the efforts of Messrs. Gilchrist and Thomas, and their backers, Messrs. Bolckow, Vaughan & Co., to produce serviceable steel from Cleveland pig, has spread over the Continent. The papers read at the meeting of the Iron and Steel Institute, and the discussion following, have been eagerly read and closely studied, and have served as the basis of a series of critical papers contributed to learned societies and technical journals. The points raised are well taken in some cases, and as the communications referred to are inaccessible to the majority of our readers, the following summary may be welcome. Foremost among the critics who are entitled to a full hearing is M. Pourcel, of Terre-Noire, whose views were given in a former issue of *The Iron Age*. In assuming that an afterblow is a necessary characteristic of the Thomas process (which we know from his patents is directly claimed as one of its distinguishing features), M. Pourcel, who contend that phosphide of iron is not carried into the slag until the carbon has been reduced to a minimum, was met by an objection based upon Bell's and Krupp's experiments. M. Grüner, who made the point in question, asked how it was possible that the metallurgists referred to succeeded in reducing the phosphorus without affecting the percentage of carbon. M. Pourcel's explanation, if verified, would prove an important point in determining the class of pig suitable for the process. He urges that in the beginning of the blow the carbon is little affected, while silicon is rapidly burned away, and with it phosphorus is decreased, provided the silica formed is neutralized by oxide of iron. As soon, however, as the silicon is low enough to permit the combustion of carbon, the carbonic oxide generated decomposes the phosphate and drives the phosphorus back into the metal, in which it remains until the carbon, by continued blowing, is carried to a certain minimum. At this point an ordinary blow would cease, and it is now that the afterblow commences, during which the removal of the phosphorus really takes place, as little carbonic oxide is generated to reduce it from the slag. The generation of the gas takes place immediately, however, as soon as the carbon of the added spiegel absorbs oxygen from the oxide of iron formed during the afterblow. The immediate result is that a certain amount of phosphorus again returns into the finished steel. According to M. Pourcel's theory, therefore, the phosphorus undergoes much fluctuation. In the beginning it decreases with the silicon, then it increases during the elimination of the carbon; it is taken out of the metal during the afterblow, and partially returns to it when the spiegel is added. In the whole process, therefore, the carbon counteracts the good effects produced by silicon, and it is only after its removal that, in the afterblow, the phosphorus percentage falls rapidly. Silicon is a necessity for the production of high temperatures, as the researches of Mueller, of Osnabrück, have shown that its combustion alone maintains the metal in fusion to the end, while the burning of the other elements has actually a cooling effect. But, on the other hand, the silica produced is obnoxious, because the larger the amount the greater the bulk of the basic additions called for. M. Pourcel claims for silicon that during its elimination phosphorus is also taken out of the metal. A time will therefore exist when the silicon and the phosphorus are low and little carbon has been consumed. An interruption of the blow at this point would represent the stage at which the Krupp process is stopped. This might be done also in the Bessemer process, the metal being separated from the slag. A continuance of the blow in another vessel would prevent the reabsorption of the phosphorus and the afterblow would, therefore, be slight only. Something similar has been planned by Mr. Thomas in his refining patent, published in a recent issue of *The Iron Age*. We note, however, that his refining vessel is lined in the ordinary manner. M. Pourcel's theory, it will be seen, is one that leads to important deductions. The fact upon which he lays particular stress is the reabsorption caused by the addition of spiegel, which he claims will render it difficult to obtain practically from Cleveland pig or iron of that class, a metal containing less than 0.20 per cent. of phosphorus.

While M. Pourcel's is the most elaborate criticism based on the chemical phenomena of the process, other metallurgists have taken up a series of practical questions which affect its commercial value. We doubt whether even the promoters of the Thomas process are, at the present stage of the experiments, in a position to render even an approximate detailed estimate of its cost, and it is manifestly impossible for outsiders to arrive at any reliable figures. We have seen statements of cost which go to prove—at least to the satisfaction of the writers—that a large margin is assured, or that, even taking a favorable estimate, no profits can be realized. One is as trustworthy as the other, as both are based on insufficient data. It is well, nevertheless, to mention the doubts which emi-

nent and practical men have expressed on points which have a direct bearing on the commercial success of the dephosphorization of pig iron in the Bessemer converter. Foremost among them is the waste in blowing. We meet on every hand a tendency to regard the statement that the waste in blowing is from 15 to 17 per cent., as one based upon only the best results obtained. Many metallurgists—among them Peter von Turner, of Austria—do not seem prepared to accept Mr. Thomas' assertion that during the afterblow the phosphorus protects the iron from oxidation. This seems to be substantiated by earlier analyses of the slag, which showed it to contain a large amount of iron. One of the German engineers, writing to the *Verhandl. z. Beford. d. Gewerbe*, publishes analyses of the cinder from a charge worked on the 13th of May in his presence, which gives the sum of ferrous and ferric oxide as 17.5 and 19.5, respectively—figures which are by no means high. Besides this loss of iron by its entering into chemical compounds, other writers fear waste mechanically, both by the admixture of globules of steel in the slag and by ejection of metal from the converter.

The latter, it is true, can and is actually avoided by making the charge smaller. This must be done also to make room for the large amount of cinder, and it is this necessity of using larger vessels to do the same work that some metallurgists do not view with favor. Intimately connected with this question of capacity of the vessels, is that of time. The data touching this point are not such as to permit any expression of opinion, nor do we find any allusions to this important factor in the criticisms of the Continental engineers referred to. One matter which seems to trouble them much is the temperature which must be provided not only to maintain the steel in a state of complete fusion until the end, but to keep an amount of cinder, almost equaling 20 per cent. of the weight of the metal, in a melted state. This can only be reached, they say, by a high percentage of silica, at least 2.25 per cent., and such metal requires large additions of basic materials and much time for blowing. The durability of the lining itself seems to be generally accepted as a fact, or at least as a matter which practical work will soon carry to the desired standard; the only objection made by one engineer being that the basic brick are apt to crumble under the action of moisture, and that therefore the converters cannot be cooled with water in order to effect repairs. On one point all agree—that the elimination of phosphorus in the Bessemer converter is, under certain conditions, an accomplished fact, and that there is every reason to believe that continued experiments will teach the means of utilizing phosphoric pig for the manufacture of steel.

In offering the above résumé of the criticisms on the Thomas process, we are not actuated by any desire to belittle the successes already obtained. We desire to direct attention to those points which call for early examination. The most important to be determined are the safe limits of silicon and phosphorus in the pig, the increase of waste compared to that experienced in blowing Bessemer pig, the time consumed, and the amount of spiegel necessary.

The Law of Patent Infringement.

During the past year there has been an unusual amount of business before the United States courts, growing out of the efforts of the owners of patents secured by grant, assignment or purchase, to defend against infringements what they have believed or claimed to be their rights. The warnings, demands, notices of prosecution, injunctions, &c., which have been freely served upon manufacturers and dealers in many lines of business, have kept the trade in a state of anxiety, which has been heightened by the fact that certain successful litigants have been able to collect large sums in settlement of royalties for infringements of patents which those interested had not previously considered of value. Other important suits, involving large, but as yet uncertain, issues, will soon be brought to trial, and forgotten or disregarded patents are, in some instances, beginning to assume an importance with which they have not hitherto been credited by those who have infringed them. As a matter of general interest, therefore, we have made the following brief synopsis of the law and practice of the courts with regard to the infringement of patents, believing that many of our readers will find the information useful. For references, &c., we are largely indebted to Simonds' Manual of Patent Law:

It is an infringement of a patent to either make, or sell, or use, without legal permit, anything which forms the subject matter of any claim or clause of claim in a valid patent. The intent to infringe is not necessary, and the patentee need not notify an infringer before bringing suit. A mere workman for the real party in interest is not an infringer¹, but, if one party were to hire another to make or use patented things, both would be held infringers². The sale of the materials for making a patented invention, as such, and with no license, expressed or implied, to use the invention, is not an infringement³.

The sale of the materials for making a patented invention, as such, and with no license, expressed or implied, to use the invention, is not an infringement⁴. Parker vs. Huime, 1 Fisher's Pat. Cases, 44. Ames vs. Howard, 2 Summer, 482. Delano vs. Scott, 1 Gilpin, 89. Keplinger vs. Young, 10 Wheaton, 352. Woodworth vs. Hall, 2 Wood. & Min., 248. Savin vs. Gullif, 2 Gallatin, 483.

¹ Meissner vs. Devos Mfg. Co., 5 Fisher's Pat. Cases, 285. ² Edwards vs. Edwards, 1 Fisher's Pat. Cases, 1. ³ Graham vs. Mason, 5 Fisher's Pat. Cases, 1. ⁴ Cahoon vs. Ring, 1 Fisher's Pat. Cases, 397. ⁵ Johnson vs. Root, 2 Fisher's Pat. Cases, 352. ⁶ Union Paper Bag Co. vs. Binney, 5 Fisher's Pat. Cases, 166. ⁷ Fales vs. Wentworth, 5 Fisher's Pat. Cases, 302. ⁸ Miller vs. Androscoggin Pulp Co., 5 Fisher's Pat. Cases, 340. ⁹ Cook vs. Ernest, 5 Fisher's Pat. Cases, 306. ¹⁰ Mowry vs. Fisher's Pat. Cases, 566. ¹¹ Baldwin vs. Bernard, 5 Fisher's Pat. Cases, 442. ¹² Hodge vs. Emerson, 11 Howard, 627. ¹³ Pieron vs. Eagle Screw Co., 3 Story, 410. ¹⁴ Kneass vs. Schuylkill Bank, 4 Washington, 14. ¹⁵ Carew vs. Boston Elastic Frog Co., 5 Fisher's Pat. Cases, 300. ¹⁶ Washburn vs. Gould, 3 Story, 187. ¹⁷ Davis vs. Palmer, 2 Brockway, 388. ¹⁸ Emerson vs. Blatchford, 6. ¹⁹ May vs. Marshall, 1 Webster's Pat. Cases, 24. ²⁰ Langdon vs. De Groot, 1 Faine's Circuit Court Reports, 293. ²¹ Lowell vs. Lewis, 2 Mason, 516.

In proceeding to determine whether a certain article is an infringement of a patent, it must be compared separately with each clause of claim in the patent; for, if any clause of the claim is infringed, the patent is infringed. The claim is the vital part of a patent, and no matter whether the actual invention be greater or less, the question of infringement is to be determined upon the claim; for a patentee must stand or fall by the claim he makes.

The thing described and claimed in the patent and another thing are held to be substantially identical, if the same result is attained by the same or equivalent means.

A claim is generally, if not always, for a specific thing or for a combination of different elements; and, having determined which the claim is for, it must then be determined whether the thing to be compared with the patent has all the parts or qualities which the claim makes essential; and, if such thing has not all these parts, then it does not infringe. Form, size and material are not generally essentials, but they may be.⁷ In any case, it matters not what names are given to parts of a device; the real question is: Do the parts compared perform the same office in substantially the same way?

It is not an infringement of a claim for a combination, to make or use or sell any of the elements of the combination less than the whole,⁸ but additions to a combination will not avoid an infringement,⁹ and a man cannot use another's patented invention simply because he has made an improvement upon it. That a device works better or worse than the patented device, is not generally decisive¹⁰ of substantial difference.

If a specific thing is claimed, or if an element of a combination is in a new field of invention, and is the first of its kind, a court will give the doctrine of equivalents its broadest application as related to such new thing; but if the specific thing, or the element of a combination, is itself new only in degree—an improvement upon some prior existing thing for the same purpose—then the court will hold only those things substantially identical therewith which are mere colorable evasions or obvious substitutions therefor.¹¹

To constitute an infringement, it is not always necessary that a person should technically infringe the claim. Where a party had a patent for a combination of a lamp burner and a lamp chimney, and another party made and sold only the burner, the judge held such makers of the burners infringers¹²; and where one party had a patent on a cartridge, and another party made and sold guns designed for firing this cartridge, the gun maker was held an infringer.¹³ In these and similar cases the intent is of importance.

Suits for infringement can be brought only in the name of the owner or owners of the patent right for the district or territory where the infringement is committed. As signees of the whole patent, or grantees of particular districts, may bring suit in their own names, but licensees cannot. The licenser is the proper person to bring suit for infringement, in the nature of infringement, to the rights of the licensee.

Suits for infringement may be either on the case at law or by a bill of complaint in equity. If the suit be brought to the equity side of the court, the complainant may, if he be entitled, get a preliminary or provisional injunction upon a mere motion. He is not compelled to go into the question of the amount of damages until the court has settled the question of the validity of the patent and the question of infringement; and a perpetual injunction issues against the defendant, as a matter of course, upon a finding by the court that the patent is valid and has been infringed. In suits at law, injunctions must be had by separate process, and in the trial of the case is involved the question of damages.

All suits for infringement of patents must be brought in United States courts.

Two things must concur to give a United States court jurisdiction—the offense of infringement must be committed and the process served upon the infringer within the territorial limits of the district in which the court has jurisdiction.

When in the course of an equity suit, the court, on final hearing upon pleadings and proofs, finds that the patent is valid and that it has been infringed, the court grants, as a matter of course, a perpetual injunction against the infringer, and, if the party thus enjoined further infringes in defiance of such injunction, he can be committed to jail for contempt of court. The same kind of injunction will be issued by the equity side of a court when a like finding has been made in a suit at law.

Provisional injunctions are asked for at the commencement or during the progress of a suit, with the intent that the defendant may be restrained from infringing until the plaintiff's right to a perpetual injunction is determined. Courts will not, as a general rule, however, grant a provisional injunction, unless there has been some previous adjudication sustaining the patent, where the same points of validity and infringement.

While the increase in demand from this source has been considerable, by far the larger demand is for iron blast furnace use.

¹ Earth Closet Co. vs. Fenner, 5 Fisher's Pat. Cases, 15. ² Tracy vs. W. W. W. 1. ³ W. W. W. vs. W. W. W. 1. ⁴ Graham vs. Mason, 5 Fisher's Pat. Cases, 1. ⁵ Fisher's Pat. Cases, 166. ⁶ Fales vs. Wentworth, 5 Fisher's Pat. Cases, 302. ⁷ Miller vs. Androscoggin Pulp Co., 5 Fisher's Pat. Cases, 340. ⁸ Cook vs. Ernest, 5 Fisher's Pat. Cases, 566. ^{9</}

The Bessemer process has created a demand for a very open iron. Certain sections that have been using raw coal, have found it necessary to use a portion at least of coke in order to produce this. In the Mahoning and Shenango valleys, for example, coke has, in many cases, taken the place of the block coals of the region. In the anthracite regions many furnaces have found it better to use a portion of coke in the charge. The average daily yield of the furnaces has been increased in some cases 50 per cent.; less pressure of blast is required, and the furnace is found to work better and with less trouble from the slipping of stock. The amount of coke used in anthracite furnaces is by no means inconsiderable, and is increasing. One firm in the Connellsburg region is shipping over 1000 tons a day East.

This increased demand is leading to a marked advance in price. A little less than a year ago coke was selling at 85 to 90 cents f. o. b. at the ovens. In the spring the price was \$1 a ton, it advanced to \$1.10, then to \$1.20, and finally to \$1.25, although some sales have been made at \$1.30. This advance has led to great activity in building new ovens, especially in the vicinity of Mt. Pleasant, in the Connellsburg region. It is estimated that something like 800 to 1000 ovens will be built this year in that region alone. We have given from time to time the projects that have been entered upon in other sections.

The increase of coking capacity is not an unwise movement if properly managed. There are certain seasons of the year when the demand for Connellsburg coke is enough greater than at others to give employment to 1000 extra ovens. At the prices ruling, coke will not bear much handling and no storing. There are no stocks carried at the ovens. It is shipped away as soon as cooled, and often before. If these extra ovens are only run as needed, there will be no overstock. If it is attempted to run them continuously, there will be a bad break in the market, especially if the coke from other regions interferes very seriously with Connellsburg.

The Coming Contest in the Stove Trade.

During the past week a meeting of stove manufacturers and dealers was held in New York, for the purpose of completing an organization known as the Stove Founders' and Stove Dealers' Alliance. The outcome of this meeting was the following circular, which we find in *The Metal Worker* of the 2nd instant:

TO WHOM IT MAY CONCERN.

The combination recently formed between Jno. S. Perry, Grange Sard, Jr., and certain other stove manufacturers who have long been fighting each other over certain claims of patent in what is called the "Anti-Clinker Grate," but have now (before reaching any legal decision as to the validity of any of their claims) joined their forces to make the other manufacturers of the country and the public pay tribute to them for the use of an article which was known and used before most of them were in the business, has led the gentlemen and firms whose names are hereto affixed, to associate together for the protection of themselves and their customers and the community against these unjust claims. They have authorized a committee of their number to answer and defend any and all cases brought against them or their customers, and hereby pledge themselves to each other and the public not to pay tribute to an article which belongs to the public and not to this "Anti-Clinker Syndicate."

Among the signers to this circular we find the following firms:

BUSSEY, MCLEOD & CO., Troy, N. Y.; CHICAGO STOVE WORKS, Chicago, Ill.; ELY & RAMSEY, New York; TROY CO-OPERATIVE STOVE WORKS, Troy, N. Y.; ROCHESTER CO-OPERATIVE FOUNDRY CO., Rochester, N. Y.; WM. DOYLE, Albany, N. Y.; M. L. FILLEY, Troy, N. Y.; C. O. GREEN, Troy, N. Y.; SCHENECTADY STOVE CO., Schenectady, N. Y.; ALBANY STOVE CO., Albany, N. Y.; SILL STOVE WORKS, Rochester, N. Y.; WOOD, BISHOP & CO., Bangor, Me.; SOLAR STOVE CO., Joliet, Ill.; CLEVELAND CO-OPERATIVE STOVE CO., Cleveland, Ohio; MONTROSS, LENT & CO., Peekskill, N. Y.; SHEELER, BUCKWALTER & CO., Rogers Ford, Pa.; MARCH, BROWNBACK & CO., Limerick Bridge, Pa.; PHILIPSBURG STOVE WORKS, Philadelphia, N. J.; ORE, PAINTER & CO., Reading, Pa.; LIERANDY & McDOWELL STOVE CO., Philadelphia, Pa.; BARSTOW STOVE CO., Providence, R. I.; WM. RESOR & CO., Cincinnati, Ohio; RAYMOND & CAMPBELL, Middletown, Pa.; THOMAS ROBERTS STEVENSON & CO., Philadelphia, Pa.; CHAR. NOBLE & CO., Philadelphia, Pa.; SMITH & ANTHONY STOVE CO., Boston, Mass.; WALKER & PRATT MFG. CO., Boston, Mass.; ESTATE OF GARDNER CHILSON, Boston, Mass.; HIGHLAND FOUNDRY CO., Boston; PLYMOUTH STONE CO., Norwich, Conn.; LITTLEFIELD STOVE CO., Albany, and others.

Simultaneously with the publication of this announcement appears circular No. 2 of Messrs. John S. Perry and Grange Sard, Jr., as trustees for what is popularly known as the "Anti-Clinker Syndicate"—comprising Perry & Co., James Spear and the Anti-Clinker Association.

(No. 2.)

IMPORTANT TO STOVE MANUFACTURERS AND DEALERS.

The undersigned, as trustees for the management of the patents controlling the "Anti-Clinker Devices," by circular bearing date June 14, 1879, notified the trade of the nature of their claims and proposed terms of settlement and license, which, in view of the great value of the improvements covered by the patents, are deemed to be the most liberal ever offered to the trade upon any invention.

"We have been surprised at the spirit in

which our proposition has been met—comparatively few persons having responded to our circular.

This result, we learn, is largely due to the industrious efforts of a few interested individuals who, regardless of the merits of our patents and not having the interests of the trade at heart, have busied themselves in attempting to organize the trade into a combination to resist the enforcement of our rights.

We desire now to say that our liberal offers were made under the supposition that all would promptly acquiesce in them.

If, however, the manufacturers and dealers

choose to organize to resist our claims, it

should be understood that they do so at their

deril.

The conditions of license and settlement heretofore proposed and now open, will be withdrawn on the 1st of September. If the unreasoning and unreasonable hostility of the trade necessitates the bringing of suits to enforce our rights, we shall prosecute such suits without fear or favor, and shall demand from the courts the uttermost farthing to which we are entitled.

There is a point beyond which endurance ceases to be a virtue. This notice is now given in all kindness of spirit, and with every disposition to save our friends from the hardships which we fear many will inevitably bring upon themselves by their present ill-advised course of opposition.

JOHN S. PERRY,
GRANGE SARD, JR.,
Trustees for Perry & Co., James Spear and
the Anti-Clinker Association.

ALBANY, N. Y., August 1, 1879.

The appearance of the first of these circulars may be accepted as ending the suspense of the trade. It means, as we understand it, that the members of the Alliance have resolved not to recognize any claims which are not established by test cases in the courts. No one whose name is appended to the circular supposes that a show of resistance will cause any material change in the policy of the trustees of the Anti-Clinker Syndicate, as outlined in their circular of June 14th, 1879. It merely gives notice that both lines of battle are drawn up, and every one acquainted with the situation knows that an engagement is inevitable. Whether such action on the part of the trade was expected by the Syndicate or not, we are unable to say; but it must have been considered as probable and preparations made for it. On the other hand, a glance at the names signed to the circular of the Alliance will convince the members of the Syndicate that the attitude of defense assumed by the Alliance is not a mere feint. Nothing remains but to strip for the fight, and if this is once fairly begun, it is likely to be bitter, protracted and costly. In the interest of all concerned, we ask: Is the kind of fight which now seems imminent an inevitable necessity?

We believe that the trustees of the Syndicate are satisfied that they control certain valuable patents upon which they are legally and fairly entitled to claim royalty; that they do not want to collect anything to which they are not legally and fairly entitled, and that they are not engaged in a gigantic attempt at blackmail. On the other hand, we believe that members of the Alliance are willing to pay the trustees what they legally and justly owe them for such infringements as may be proven in cases where the infringed patents are good and valid; that they are unwilling to recognize any claims which are not just and legal, and that they are not engaged in a conspiracy to defraud the Syndicate out of anything which may be justly due its members. We have abundant assurances from both sides that this view of their relative positions on the anti-clinker controversy is correct. If so, cannot the questions at issue, including that of damages where infringement is proven, be settled by arbitration—claimants and defendants agreeing to abide by the results, and protect the dealer against molestation from any source? This is not an unusual proceeding in such cases, as the records of patent litigation abundantly show. By this means all questions affecting the validity of the patents introduced on either side can be determined, and questions of damages adjusted in six or eight months without great cost. If, on the other hand, suits are begun, to be dragged along through the courts and finally appealed, as they are likely to be unless one side or the other surrenders before reaching the Supreme Court, the agitation may last for five years, or even longer, enormous and burdensome costs will be incurred, and we shall have as the result an illustration of the truth of Wellington's epigram, that in war nothing is so disastrous as victory—except defeat.

We make the suggestion of arbitration solely and wholly on our own responsibility. No one representing either party in the coming struggle has spoken with or written to us on the subject, nor in any way intimated directly or indirectly that such a proposition would receive favorable consideration. We make it unadvised, and wholly in the interest of peace, harmony and justice. It may be impracticable, owing to the unwillingness of one or the other of the parties in interest to agree to accept the results of arbitration. It is, however, worth an effort. If the members of the Alliance are acting in good faith, and are as ready to pay just claims as they are determined to resist those which they believe to be unjust, they cannot do better than to appoint a committee to confer with the trustees of the Syndicate concerning arbitration. What would be the result of the conference we have no means of knowing, but if arbitration could be brought about, it would be vastly better than a fight. The lawyers would be disappointed; but we

imagine that few manufacturers are anxious to spend much money just now in lawyer's fees and court expenses.

Unprecedented Exports of Live Cattle.

Never before since the beginning of the trade have the exports of live cattle from New York been on such an extended scale as at present. The sudden suspension caused by hostile legislation in England is succeeded by a sort of reaction, it being evident to all that the scheme for diverting this trade across the St. Lawrence River is a failure. Moreover, the English—or, rather, the people of the United Kingdom—are convinced of the excellence of American beef, and their demands cannot be met without liberal supplies. Last Saturday was a gala day with the New York exporters.

On the morning of that day no less than 1215 head of cattle were put on shipboard, distributed among a half dozen outgoing steamers on the North River side, by means of a steam barge expressly adapted to the purpose, which made repeated trips between the great stock-yards at the foot of Sixty-first street and the several piers down town until the work was accomplished. One of the shippers speaks of the scene in the small hours of the morning as something indescribable, surpassing all former experiences; but the transfer of the struggling animals was made without accident. The cost of ferrage alone in this part of the operation—30 cents per head—was \$360. The next item of expense was £3.10., or \$15.50, per head for the transatlantic voyage, making an aggregate of \$19,192 in cash, all of which must be paid in advance. Adding cost of insurance, halters, feed and special attendance while afloat, it is easily seen that a considerable amount of capital is needed in this business even after disbursing an average of \$100 per head for the animals in the Western market, and paying freight charges on railways to the seaboard.

From this it will be seen that, so far as live cattle are concerned, the export movement is very active, indicating a marvelous change since the first edict was issued for the protection of the grazing interests of the British farmer (ostensibly to exclude contagious disease), but shippers complain of small profits. The times are hard in England and prices low. One shipment to Belgium yielded no profit whatever.

Our informant further explained that "prices are low because we are restricted in the market, as the cattle must be slaughtered where they are landed. We can't take them all over, as formerly. But Canadian, Irish or British cattle can be taken off alive, and consequently command at Deptford £2 per head more, though much inferior."

The New York exporters are confident that the Canadians are wholly defeated in their so-called conspiracy to embarrass the trade in the United States for their own benefit. Those concerned in the intrigue never anticipated a prohibition from the Dominion government excluding "States" cattle, and their own limited supplies having become exhausted, trade of necessity reverts to its old channel. American mutton is likewise growing in favor. According to an off-hand estimate, three-fourths of all the beef now shipped from New York is sold alive, and at least 6000 horned cattle have been shipped within the last six weeks. Boston is also doing a fair business, and some are sent from Philadelphia.

A gentleman who has been interviewed by a Western newspaper reporter as to the result of his observations during a recent visit to the oil regions, has ventured an opinion, based upon information gained during several days' observation, that the government should promptly interfere and stop further boring and pumping. He is quite certain that this oil was accumulated in the strata whence it is drawn for the purpose of lubricating the bearings of the earth's axis, and that when this lubrication is exhausted the world will cease to revolve. We are not yet prepared to accept this theory, with all that it implies; but really, if such a thing is possible, the matter ought to be looked into. If it had been thought of soon enough we might have had a Congressional committee to sit during the summer at Cape May or Long Branch, with instructions to report during the winter season. Perhaps the high temperatures from which we are now suffering are due to hot boxes somewhere along the earth's axis.

A semi-annual meeting of the Metropolitan Railway Company—underground—of London, was held on July 16. The directors found a dividend of 5 per cent. earned from January to July, after retaining the ordinary surplus for repairs account. They reported that the business had been affected by the unfavorable condition of trade and by the unprecedentedly bad weather. This latter cause told particularly on the important pleasure traffic. Only four Sundays, for instance, out of the 26 had been fair. The capital account presented unusually favorable features. When the present Board of Directors took office in 1872 the capital was—at \$5 to the pound—\$42,810,000, of which \$4,960,000 represented undischarged liabilities for which there was no proper provision. In 1879, adding the liabilities and omitting surplus property, the capital stands at \$44,535,000, or about \$1,300,000 less, while the net revenue shows the enormous increase in seven years of 50 per cent. In the half year just closed the road had carried nearly

30,000,000 of passengers, or about 560,000 more than during the corresponding half year on the same mileage. Although there had been a decrease of 132,000 in first-class passengers and of 48,000 in second-class, this deficiency had been met by the extraordinary increase in third-class passengers of 542,000. These figures, when compared with the metropolitan system in this city, show a daily movement through the dark, damp, sooty and gaseous tunnels of London of 20,000 passengers more than are carried daily over the three elevated routes in this city.

SCIENTIFIC AND TECHNICAL.

According to a correspondent of *La Lumière Électrique*, M. Marcel Deprez has succeeded in devising

AN ELECTRO-MAGNETIC MOTOR

capable of doing useful work in many industrial applications. Deprez's apparatus is barely 8 inches long by less than 6 inches in breadth. It weighs about 6½ pounds, and can supply a power of nearly 8 foot pounds per second with five Bunsen elements. This is considered an extraordinary result, and one which could scarcely have been anticipated a few years ago. Under these conditions sewing machines may be worked by electricity without any cumbersome apparatus. This ingenious system consists of a horseshoe magnet of eight plates 5¾ inches in length, between the poles of which is introduced a Siemens armature, acted upon by the magnet over a length of 2¾ inches.

The electro-magnetic armature, instead of being placed transversely to the magnet, is arranged longitudinally and parallel to it. Under these conditions the magnetic power is found to be considerably augmented. The axis of the electro-magnet is parallel to the coils of wire in the magnetizing helix, and, consequently, to the arms of the magnet. At one end it carries a reversing commutator, and at the other end it is provided with a pinion which gears into a wheel, of which the diameter is 30 times greater. When the apparatus is properly regulated, the armature makes 90 revolutions per second, and, consequently, the wheel which it acts upon makes three revolutions. It is upon the axis of this wheel that are fixed the pulleys transmitting the movement, and by which the engine is caused to work either a sewing machine or any other apparatus that is to be set in movement.

M. Anatole Mallet, a well-known French railway engineer, recently read before the Institution of Mechanical Engineers an exhaustive paper on his experience with

THE COMPOUNDING OF LOCOMOTIVE ENGINES. M. Mallet believes, and has shown by practical experience, that the compound system is peculiarly advantageous to locomotives, for which steam jacketing cannot perform the good work it does with stationary engines, which may be supplied with delicate cut-off gears for high expansion, none of which have been able to stand the test of practical working when applied to locomotives. The compound system admits of using in each cylinder only moderate degrees of expansion, such as are very readily obtained with single slide valves, worked by the ordinary kinds of link motion. M. Mallet designed a locomotive differing as little as possible from the ordinary type, the small and large cylinder being connected by a special contrivance, enabling the engine to be worked at any time with direct admission and exhaust in both cylinders. They were first tried on the Biarritz and Bayonne Railroad with six-wheeled tank engines. The consumption of coal for the average of one year's working was 0.206 pounds per mile per ton. An improvement was introduced in the engines built for the Haironville and Triacourt narrow gauge road, the object of which was to prevent the considerable drop of pressure occurring between the two cylinders, owing to the capacity of the intermediate chamber or receiver. It was necessary also to provide an arrangement for cutting off to best advantage in both cylinders, instead of making the expansion equal in both. M. Mallet has also added a self-acting reducing valve, with the purpose of keeping the power equal on both sides of the engine, and of preventing the total pressure on the area of the large piston, replacing a smaller one in remodeled engines, from endangering the working parts retained and originally designed for a given pressure only. In compounding existing engines, M. Mallet generally retains one of the original cylinders as the high-pressure cylinder, and replaces the other by a new one of larger dimensions for expanding.

A correspondent of the *Moniteur Scientifique*, M. Guyard, claims to have discovered, as early as 1869, a

NEW METAL (OURALUM),

belonging to the platinum group, and found in the platinum obtained in the Russian Oural, from which the name of the new element is derived. Its physical properties seem to approach those of the well-known metal, but it is claimed to be whiter than the latter, while its density is 20.25. Its atomic weight is placed at about 187, and its molecular volume at 6.25. M. Guyard was led to the discovery by observing very constantly a fine scale, yellow color, when cooling a fused mixture of an excess of cyanide of potassium and bichloride of platinum. Beyond this no chemical characteristics of the salts of ouralum are given.

The *Deut. Industrie Zeitung* gives illustrations of

LUEDTGE'S TELEPHONE,

which, being of earlier date than the microphone, anticipates some of its features. It is used as a transmitter only, a Bell telephone serving as a receiver. The vibrations of the membrane are transmitted to an apparatus attached to the membrane itself. It consists of two carbon pieces, one of which is level, while the other is rounded. The variations of resistance to the electrical current at this point, while speaking, causes the vibrations of the membrane in the receiving telephone. The two frames containing the carbon pieces are connected by two strips of caoutchouc, which, being poor conductors of sound vibrations, decrease their intensity when passing to the second point, so that there is a difference between the intensity of the second vibrations of the

rounded and the flat point. When well adjusted, the apparatus is said to be exceedingly sensitive.

Mr. Edward Weston, of Newark, the well-known inventor of dynamo-electric machines for plating and illuminating, has made some important discoveries in the use of

BORACIC ACID FOR NICKEL-PLATING SOLUTIONS.

He has found that an addition of boracic acid or its salts to nickel-plating solution prevents the deposition of subslabs of nickel on the cathode, so that thick deposits of the metal may be rapidly obtained. The deposit has a fine white color, is easily polished and adhesive, and the solution from which it is deposited does not change in composition, circumstances which enable the use of nickel for electrotyping. A good solution may be made by using 5 parts of chloride of nickel and 2 parts of boracic acid, or by taking 3 parts of sulphate of nickel and 1 part of boracic acid. Both are slightly improved by the addition of caustic alkali until the precipitate formed do not dissolve. As the metal deposited is ductile instead of being hard and brittle, it is fit for many purposes to which nickel as ordinarily deposited cannot be put. We have seen samples of Mr. Weston's work which seem to bear out his claims.

The simultaneous use of caustic soda and sulphate of aniline is recommended by Herr Schöen, of Mühlhausen, Germany, for

IMITATING THE COLOR OF OLD OAK. He tried the effect of this mixture on various woods and found that the desired dark brown tone was obtained. He was similarly successful in dying all woods black by the successive application of sulphate of aniline, bichromate of potash and caustic soda, the wood being dried after each operation.

The *American Journal of Science and Arts* contains an elaborate paper on

THE GENESIS OF CINNABAR DEPOSITS,

read by Dr. Christy before the California Academy of Sciences. Dr. Christy has gone into an elaborate discussion of the question whether cinnabar, the chief ore of quicksilver, in which California is so rich, has been deposited where now found by sublimation or by precipitation from solution. He calls attention to the fact that, with few exceptions, the veins of cinnabar, which generally bear the character of impregnations, are not in immediate relation to igneous rocks. As a direct proof of their aqueous origin, he cites experiments in which he succeeded in dissolving sulphide of mercury in alkaline waters saturated with sulphuretted hydrogen, at an elevated temperature and high pressure, and in depositing crystalline sulphide of mercury or cinnabar by slow cooling. Dr. Christy disproves an idea that many who know the volatility of metallic mercury hold regarding its origin. It is probable from his experiments, and from the nature of cinnabar deposits and the associated rocks, that veins of mercury ore were not formed by sublimation, but by deposition from alkaline solutions under certain conditions.

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Manufacturer of Pen and Pocket Cutlery, Pepperell, Mass.
My Blades are forged by hand from the best Cast Steel, and warrant
ed. To me was awarded the Gold Medal of the Conn. State Agricultural Society.
Office in New York with E. P. Whipple, 100 Chambers St.

NAUGATUCK CUTLERY CO.,
Manufacturers of FINE PEN & POCKET CUTLERY.
FULLER BROS., Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

HALL, ELTON & CO.,
Electro Plated Ware, German Silver and Britannia Spoons.



Factories, Wallingford, Conn.

STANLEY RULE AND LEVEL CO.,

MANUFACTURERS OF

Improved
Carpenters'
Tools.

No. 113. Improved Adjustable Circular Plane - \$4.00

WE MAKE ALL KINDS OF

GARDEN TOOLS

AND

House Furnishing
Goods.

ENTERPRISE MFG. CO., Geneva, Ohio.

Ask for Catalogue and Discounts.

Wilson Bohannan,
Manufacturer of Patent

BRASS PAD LOCKS

For Railroad Switches, Freight Cars, and the Hard-
ware Trade. All sizes, with Brass and Steel Keys,
with and without chains.Patent Horizontal Rim Cylinder Night Latch.
Self-adjusting to doors of any thickness, with Patent Stop and Drawer Back Knob
RIGHT OR LEFT HAND.PASSENGER CAR LOCKS, Bronzed, Nickel-Plated and Japanned.
Catalogues and Samples sent upon application.

BROOKLYN, N. Y.

Romer & Co.

Established 1837.



Manufacturers of Patent Scandinavian or Jail
Locks, Brass Pad Locks for Railroads and Switches.
Also Patent Stationary R. R. Car Door Locks. Pat-
ent Piano and Sewing Machine Locks.
141 to 145 Railroad Avenue, NEWARK, N. J.
Illustrated Catalogue sent to the trade on appli-
cation.

MACHINE MOULDED
MILL GEARING,AS ACCURATE AS CUT GEARING
AND MORE DURABLE IN USE.
Saves Time and Expensive Patterns,

SHAFTING, PULLEYS AND HANGERS.

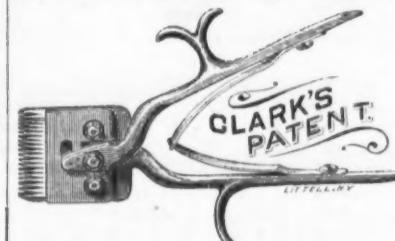
A SPECIALTY,

LEFFEL TURBINE WATER WHEELS,
STEAM ENGINES AND BOILERS,
MIXERS FOR FERTILIZERS AND CHEMICALS.

POOLE & HUNT Baltimore.

Cutlery.

HAVE YOUR HAIR CUT.



Clark's Hair Clipper.

Extensively used and the only reliable machine
for close clipping. Simple in operation and finishes the work in
short time.MCCOY & CO.,
Sole Agents,

132 Duane Street, New York.

Silver Medal, 1878—Paris.



J. R. SPENCER & SON,
Albion Steel Works, Sheffield,
MANUFACTURERS OF
FILES
AND
STEEL,
Table Knives, Razors, Shovels, &c., &c.,
of every description.

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N SPENCER
SHEFFIELD
Granted 1749.

Zuccato's Papyrograph

Cutlery.

ALFRED H. HILDICK,

12 Warren St., N. Y.,
Importer of CHAINS, ANVILS, VISES, &c.
HILL BROTHERS & CO., WALSALL, ENGLAND
GENERAL HARDWARE MERCHANTS,And of
BALL'S PAT. SOLID STEEL SHEEP SHEARS.
These shears are unsurpassed for cheapness, dura-
bility and utility. They are made of one solid piece
of steel from point to point, and cannot be broken in
use. The cutting edge is at the junction of the handle
and blade. Samples can be seen at above address, or
sample lots furnished.

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Joseph Rodgers & Sons'
(LIMITED)

CELEBRATED CUTLERY,

No. 52 Chambers Street, New York.

F. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons' products having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.
To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.

Young's Patent Folding Scissors.



HAVING largely increased our facilities for the manu-
facture of these very popular goods, we offer them to
the trade at a large reduction from our former
prices. The list price of the large size is now \$12.00
per dozen, formerly \$18.00, and the small size, \$9.00,
formerly \$12.00. The quality of the work is the same.
Young's Patent Folding Scissors is the
very best. All are nickel-plated and furnished with
a neat morocco case.

MARX BROS., Proprietors,

430 Broadway, New York.

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COLEMAN EAGLE BOLT WORKS

ESTABLISHED 1845.

WELSH & LEA. NORWAY IRON CARRIAGE & TIRE BOLTS, AXLE CLIPS, &c.

Highest and only Awards and Medals, Philadelphia, 1876, and Paris, 1878.

WORKS, Columbia Avenue, Hancock and Mascher Streets.

OFFICE, 145 Columbia Avenue (late 2030 Arch St.)

PHILADELPHIA, U. S. A.

THE WM. ROGERS MANUFACTURING COMPANY AND THE ROGERS CUTLERY COMPANY, MANUFACTURERS OF Cutlery and Silver Plated Table Ware.

TRADE MARKS:

Established 1871.

On Spoons, &c. 1871 ROGERS & 5 oz.

Established 1865.

WM. ROGERS & SON, AA.

On Knives..... ROGERS GO HARTFORD CONN. 12

WM. ROGERS & SON HARTFORD CONN. 12

Our KNIVES are guaranteed

Our SPOONS, FORKS, &c., are guaranteed

TO STRIP

On Tea Spoons..... 48 dwts. per gross
On Dessert Spoons and Forks.... 72 dwts. per gross
On Table Spoons and Med. Forks. 96 dwts. per gross

ALL OTHER GOODS IN PROPORTION.

All our SPOONS, FORKS, &c., are

guaranteed to be plated upon

18 per cent. NICKEL SILVER,
the best known base for plating
upon.

OUR GOODS ARE PLATED 20 PER CENT. ABOVE STANDARD PLATE.



Address all communications to

THE WM. ROGERS MANUFACTURING COMPANY,

Drawer 30, Hartford, Conn.

WM. H. WATROUS, President.
F. WILLSON ROGERS, Secretary.

GOODELL COMPANY, Antrim, New Hampshire.



At the request of many of our customers we are now making a plain Beech Handled Butcher Knife, for the special use of practical butchers who want a handle that will not slip in the hand. The blade has the same unequalled cutting qualities of all our other Butcher Knives, and the handles are fastened to the blade in our usual way. With large additions recently made to our factory and machinery, we are prepared for our increasing trade, and respectfully solicit the public patronage.

BURRALL'S PATENT CORN SHELLER AND SEPARATOR.

Right-Handed.



It is best and cheapest.
It is a right-handed Sheller.
It is all iron and very durable.

It shells and separates perfectly clean.
It will shell either large or small corn.
It has no outside gears and will not clog.

We manufacture the only genuine *Burrall Corn Sheller*, having been making them for the past 15 years. It is therefore of very great importance that you should purchase shellers with our name on to avoid trouble in getting repairs. We can pack from six to eight in a hogshead. For prices or other information, address

THE GOULDS MANUFACTURING CO.,

FACTORY: Seneca Falls, N. Y. WAREHOUSE: 15 Park Place, New York City,
H. W. AUSTIN & CO., Agents, Chicago, Ill.; BIGNALL & OSTRANDER, Agents, St. Louis, Mo.

PRICES REDUCED ON TAPER REAMERS For Bit Brace.

These useful tools, which were originally introduced by us about two years since, have been so well liked that we are confident of a much larger trade in them now that we have completed our arrangements, by which we are able to make the large reduction in prices which is shown in following lists:

	Old Prices.	New Prices.
1/4 inch.....	\$5.40 per doz.	\$2.40 per doz.
5-16 ".....	6.00 "	3.00 "
3/8 ".....	6.60 "	3.60 "
7-16 ".....	7.20 "	4.20 "
5/8 ".....	8.40 "	4.80 "
Set in case.....	3.00	1.70

As we prefer to sell our goods through the trade rather than by peddlers, we shall continue to give a liberal discount to the trade. Sample case with first order free. Although we have reduced the prices, we shall continue to maintain the same high standard of excellence by which we have gained and kept our trade in them, and which we aim to do in all tools made by us.

Send for Circular.

WELLS BROS., Greenfield, Mass.,

Manufacturers of New and Useful Tools.

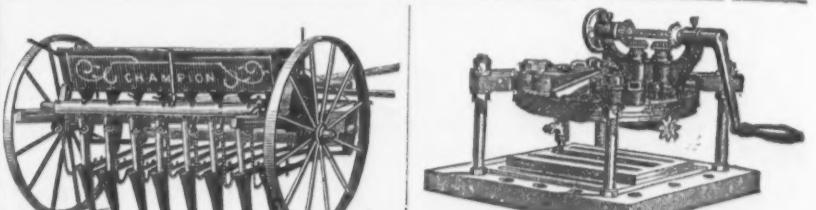


PERFECT SASH LOCK, No. 12, EXTRA HEAVY.

Payson & Co.

MANUFACTURERS OF
BUILDERS' HARDWARE,
1319 to 1325 W. Jackson St.,
CHICAGO.

LOVEGROVE & CO., PHILADELPHIA, PA.,

MANUFACTURERS OF
BOILERS & ENGINES, ALL SIZES.
1-HORSE ENGINE AND BOILER, \$150; 2-HORSE, \$175; 3-HORSE, \$200; 4-HORSE,
\$250; 5-HORSE, \$275; 6-HORSE, \$300; 8-HORSE, \$425.
WARRANTED THE BEST. SEND FOR CIRCULAR.

CHAMPION GRAIN DRILL.

New model made expressly for the export trade.
Received Medal at the Centennial Exposition. A machine of long established reputation for efficiency and durability. Circular mailed on application.

JOHNSON, GERE & TRUMAN, Owego, N. Y.

PATENT PORTABLE VALVE SEAT ROTARY PLANING MACHINE.

Manufactured by the
L. B. Flanders Machine Works,
1025 Hamilton St., Philadelphia,
Descriptive Circular on application.

ENTERPRISE MANUFACTURING COMPANY of Pa.,

Patented Hardware Manufacturers and Iron Founders,

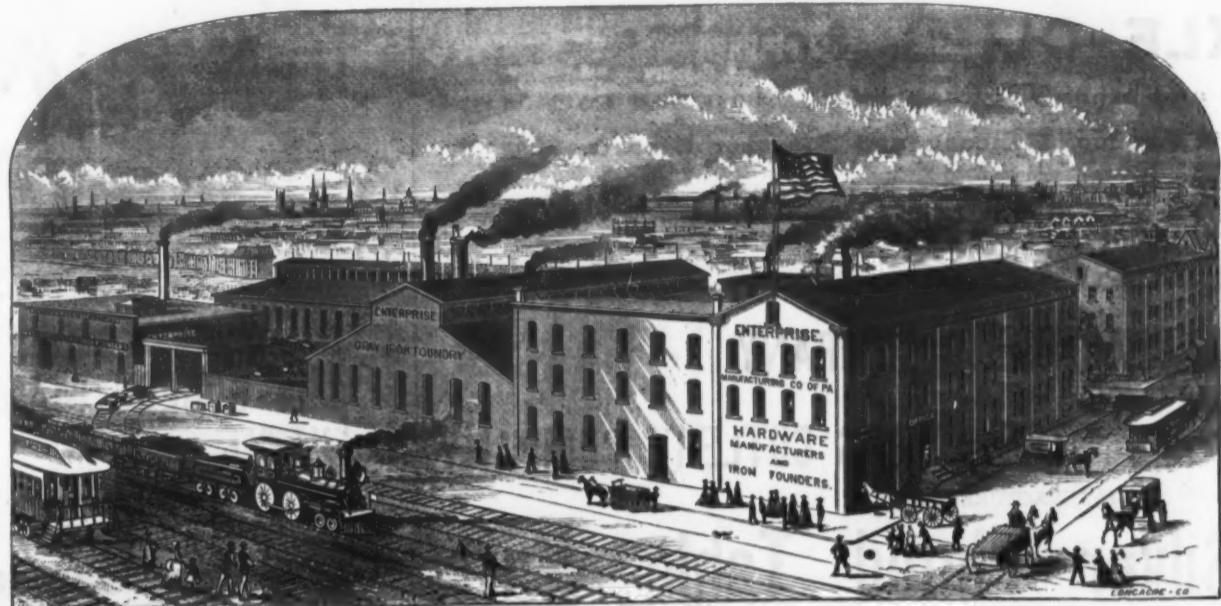
Third and Dauphin Streets, Philadelphia.

New York Branch House with HORACE DURRIE & CO., 97 Chambers Street, New York.



Showing Mill Closed.

Twenty Sizes.



VIEW OF WORKS.



Showing Mill Open.

From \$2 to \$100.



Combined Sausage Stuffer, Fruit,
Lard and Jelly Press.

EIGHT STYLES, From \$2 to \$9.



Self-Measuring
Faucet.

Warranted to draw and
measure correctly a gallon
of the thickest Molasses in
winter in one minute.

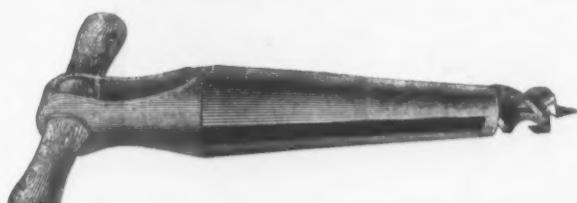
PRICE, \$3.



Enterprise Self-Weighing
Cheese Knife and Safe.

WEIGHS
CORRECTLY
AND IS
LABOR SAVING

Without Cover..... \$10.00
With Cover..... 12.00



Enterprise Bung-Hole Borer or Hollow Auger.

THREE SIZES, From \$1.50 to \$3.



Showing a Set of No. 50 or 55 Irons.

Double-Pointed Smoothing, Polishing
and Girls' Toy Irons.

THE BEST
IN THE
MARKET.



Champion Dried Beef Shaver, Potato,
Fruit and Vegetable Slicer.

PRICE, \$6.

Unique Butter Knife
and Extractor.

For extracting Butter, &c.,
from the tub or package in a
neat and clean condition.



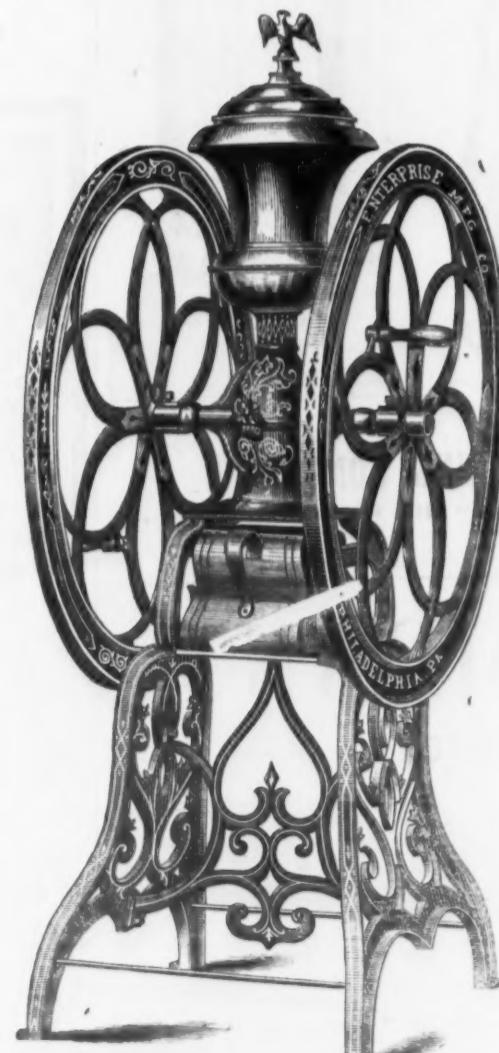
PRICE, \$1.25.

Enterprise Tincture
Press.

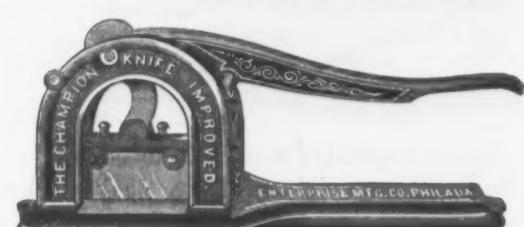
SUPERIOR
TO ANY
IN THE
MARKET.



FOUR SIZES, From \$3 to \$10.



No. 20 Mill.

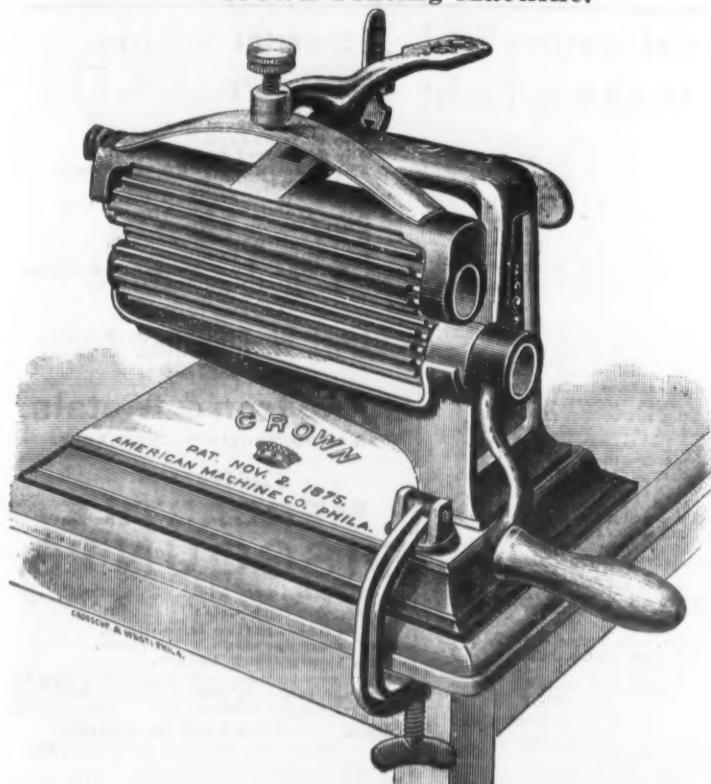


Champion Tobacco, Root and Herb Cutter.

No. 1, \$2; No. 2, \$3.

FOR SALE BY THE HARDWARE TRADE.

Crown Fluting Machine.



Sizes (length of Rolls), 4½ in., 6 in. and 8 in., with 10, 12, 15, 18, 22, 26 or 30 Flutes.

Original "Knox" Fluting Machine.



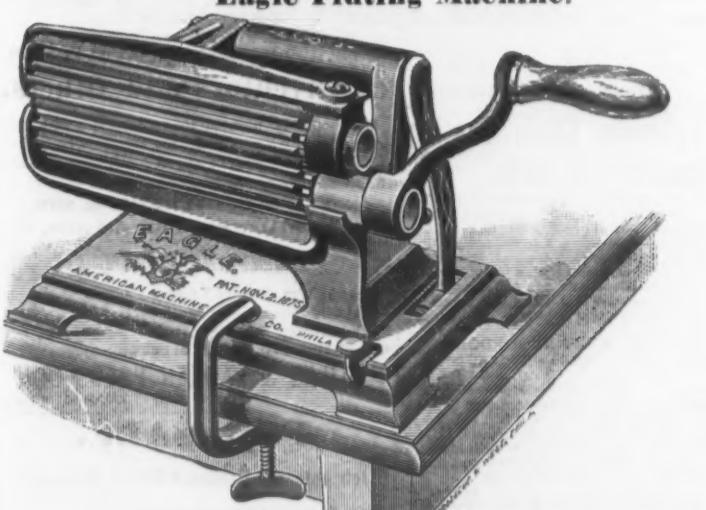
Sizes (length of Rolls), 6 in., with 10, 12, 15, 18, 22, 26 or 30 Flutes.

American Fluting Machine.



Sizes (length of Rolls), 5 in., 6 in., 7 in., with 12, 15, 18 or 22 Flutes.

Eagle Fluting Machine.



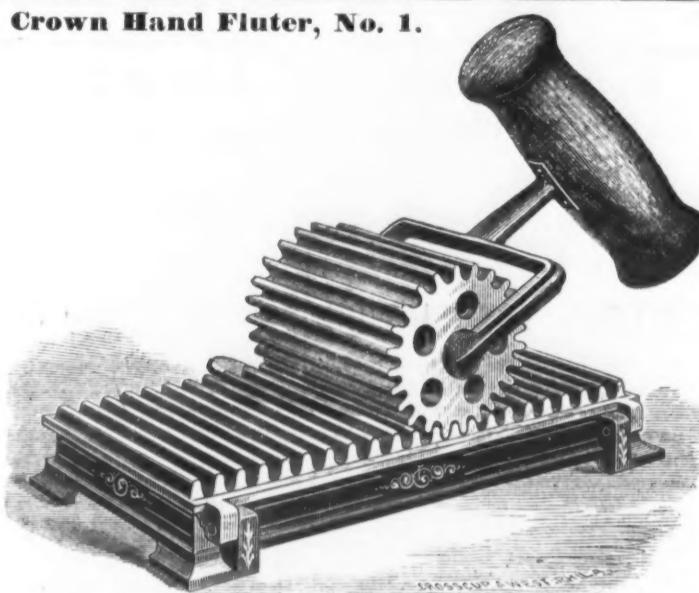
Sizes (length of Rolls), 3½ in. and 5½ in., with 15 or 18 Flutes.

THE

AMERICAN MACHINE CO., Hardware SPECIALTIES.

MANUFACTURERS OF

Crown Hand Fluter, No. 1.



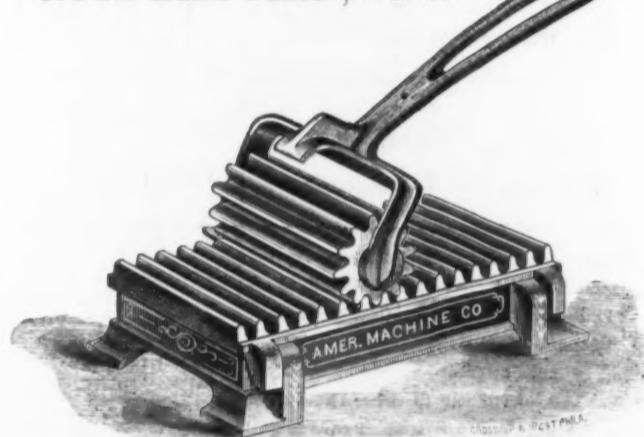
Size, Baseplate, 6½ in. long, 3¼ in. wide. Roll 2½ in. diam.

Crown Hand Fluter, No. 2.



Size, Baseplate, 6½ in. long, 3¼ in. wide. Roll 1½ in. diam.

Crown Hand Fluter, No. 3.



Size, Baseplate, 5½ in. long, 3 in. wide. Rolls 1½ in. diam.

SPECIALTIES:

Crown Fluting Machines,

Star Fluting Machines,

Eagle Fluting Machines,

American Fluting Machines,

Original "Knox" Fluting Machines,

Crown Hand Fluters,

Crown Plaiting Machines,

Bickford Portable Pump,

Crown Christmas Tree Holders,

Crown Can Openers,

Mrs. Potts' Patent Crown Sad irons,

&c., &c., &c.



Special Notices.

Auction Notice.

SALE OF TABLE CUTLERY.

BISELL & WELLES, Auctioneers.

Will make a SPECIAL SALE OF AMERICAN TABLE CUTLERY, SECOND QUALITY, by order of the

CUTLERY ASSOCIATION,

On Tuesday and Wednesday,

AUGUST 10th and 20th,

Commencing at 10 o'clock, A. M., at their SALESROOM,

83 Chambers and 65 Reade Sts., N. Y.

This will be the First offering of Second Quality Goods this season, and will consist of over 12,000 dozen pieces of Cutlery, including a large and varied assortment, also an attractive line of Bone and Ivory Knives, Carvers, Butcher Knives, Steel, &c., &c., together with a line of some number of First Quality Goods, including a line of Butter Knives, Ivory Knives, Plated Steel Knives, &c., &c. The above goods are of the manufacture of the John Russell Cutlery Co., Landers, Clark & Clark, Lamson & Goodnow, G. Co., and American Cutlery Co. The high standard and close selection of the above Companies' Second Quality Goods make them very desirable to purchase, and the trade will be sure to find in this sale a good value in this sale a desirable line of Pocket Cutlery, Silver Plated Goods, Scissors, Shears, &c. Those having surplus stocks of these goods, and who desire to contribute to this sale, will be given the opportunity of doing so. Consignments should be forwarded as early a date as possible.

TRADE SALE OF HARDWARE,

THURSDAY AND FRIDAY,

August 28th and 29th,

Comprising a large assortment of Hardware, Table and Pocket Cutlery, edge Tools, Silver Plated Goods, French Tin and Enamelled Ware.

Consignments and Inquiries, who desire to contribute to this sale, will please forward at as early a date as possible.

BISELL & WELLES, Auct'rs,

83 Chambers and 65 Reade Sts., N. Y.

THE EXPOSITION.

The Third Exposition under the auspices of the

Pittsburgh Exposition

Society

Will open to the public on

September 4 and close October 11, 1879.

Manufacturers, Artisans, Inventors,

Merchants and Tradespeople

Generally, are invited to send in their applications soon and secure desirable space. The number and character of Exhibits already secured for this Exhibition warrant its entire success; the special attractions alone (secured at great expense by the Managers) being sufficient to draw the masses from our cities and surrounding towns.

All communications in reference to the Exposition should be addressed to

J. C. PATTERSON, Secretary, or

E. P. YOUNG, Gen'l Manager,

F. A. PARKE, Assistant Manager.

GRADUATING MACHINES

And a full line of machines for making Rules, Levels and other Tools.

RICHARDS & DOLE,

Springfield, Mass.

Designers and Builders of Manufacturers' Tools and Special Appliances.

WANTED.—Partner with \$10,000 to \$20,000 in the Iron Manufacturing business, located in Easton, Pa., using about 200 tons iron per month in their regular trade, which can be largely increased, being now obliged to refuse orders. Have large works in complete order which have been running continuously for 8 years. A party with a knowledge of the rolling mill business preferred, to manage the manufacture of light bars and rods for our own consumption. First class references given and required.

Address

T. B., New York

WANTED.—A SITUATION BY A YOUNG

Man who speaks English and German, and

having five years' experience in the retail Hardware business, by some wholesale or retail Hardware House. A no reference furnished.

Address

Lock Box 156, Goshen, Ind.

FOR SALE—177 doz. a-time Hay Forks—plain

ferrule, 5 and 5/8 feet handles; 50 doz. 3-time

Hay Forks, 5 feet handles; 50 doz. 4-time Hay

Forks, 5 1/2 feet handles; 100 doz. C. S. Garden Rakes, mostly 14 teeth; 15

doz. 4-prong, C. S. Garden Weeder. These are

all first quality goods, and for immediate cash

will be sold at 10, 10 and 5 per cent. discount from

list. Address

BARGAIN.

Office of The Iron Age, 83 Reade St., New York.

WE WILL TRADE LAND,

Improved or wild, for

HARDWARE, STOVES OR NAILS.

Land is near Topeka.

THOMPSON BROS.

Topeka, Kansas.

CATALOGUES, PRICE LISTS AND DISCOUNT

Sheets thankfully received by

JAMES EVANS,

Hardware Merchant,

Port Hope, Ontario.

KANSAS LAND

To Exchange for Hardware,

Farm land and dwellings, all paying rental of 12

to 20 per cent. per annum, aggregating in value

\$1,000. Address

DRAPER & BOWYER,

Oswego, Kansas.

WANTED.—A SITUATION AS SUPERIN-

TENDANT or manager, by a practical man

who thoroughly understands the manufacture of

iron in all its details, including merchant bar,

hoops, sheets, plate and tank iron, &c. Satisfactory references. Address

"HORN,"

Office of The Iron Age, 83 Reade St., N. Y.

THE EDDY VALVE PATENT SUIT

IS NOW ENDED,

and we, you, and all others are free from all risk

and liability on account of, or because of, said

present or future buying, selling, using, Eddy

Valves MADE BY US. We hope that those

have been unwilling, on account of said suit, to

buy or use our valves, will now favor us with

their orders.

THE MOHAWK & HUDSON MFG. CO.,

Waterford, N. Y. August 1, 1879.

Wanted,

A first-class Superintendent and Salesman for an

establishment in the West manufacturing Cast-

Iron and Gas Water Pipe. Only those thoroughly

acquainted with the business need apply.

Address immediately, with references.

J. MCBRIDE WATSON,

Hoffman House, New York City.

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A first-class Superintendent and Salesman for an

August 7, 1879.

THE IRON AGE.

Trade Report.

Office of THE IRON AGE.

WEDNESDAY EVENING, August 6, 1879.

The financial markets have been without important feature during the past week. The decline in the rates for foreign exchange to the point at which gold coin could be profitably imported, led to an order for \$200,000 in double eagles from Paris. This was foreseen last week, and has excited little comment. The local money market has been fairly steady, call loans averaging 3%, with a spasmodic advance to 7% about the middle of the week, when the Treasury called in \$8,000,000 from the banks.

Government bonds are about steady, having been strong early in the week and heavy toward the close. We quote below the closing quotations. Railroad mortgages are strong.

In the stock market there has been a moderate speculation, especially in railroad shares, which have been strong and buoyant. The principal dealings have been in Lake Shore, Northwestern, St. Paul, Wabash, Kansas City and Northern and the coal stocks. We give below the closing quotations of active shares.

The bank return shows an increase of \$244,875 in surplus reserve, which now stands at \$13,614,825, against \$21,606,275 at this time last year, and \$13,606,250 at the corresponding period in 1877. The loans show an increase this week of \$9,697,500; the specie is down \$275,200; the legal tenders are increased \$3,367,000; the deposits other than United States are up \$11,387,700, and the circulation is increased \$45,300.

The following is an analysis of the bank totals of this week compared with that of last week:

July 26.	August 2.	Comparisons.
Loans.....	\$260,522,600	\$267,280,100
Specie.....	19,937,600	19,632,400
Legal tend'res.....	54,288,100	57,655,100
Tot. reserve.....	74,215,700	77,379,500
Deposits.....	243,83,000	254,770,700
Reserve required.....	60,810,350	63,602,675
Surplus.....	16,369,950	13,614,825
Circulation.....	20,549,500	20,594,800

The foreign trade movements at the port of New York since our last issue are shown in the following tables:

IMPORTS.

For the week ended August 2:	1878.	1879.
Dry goods.....	\$2,154,553	\$1,409,818
General mdse.....	4,774,314	4,557,218
Total for week.....	\$6,928,867	\$5,967,036
Prev. reported.....	106,545,226	103,759,872
Since Jan. 1.....	\$203,474,093	\$169,725,908
1878-79.	\$183,757,797	

Included in the imports were items of merchandise valued as follows:

Quantity.	Value
Anvils.....	\$99
Brass goods.....	10
Bronzes.....	17
Chains and anchors.....	2,860
Copper.....	3,011
Cuver.....	119
Guns.....	459
Guns and breeches.....	93
Hardware.....	3,383
Iron, pig, tons.....	200
Iron, sheet, tons.....	285
Iron ore, tons.....	6,648
Iron, other tons.....	191
Lead, pigs.....	1,707
Metals, goods.....	160
Nickel.....	10,857
Old metal.....	5
Platinum.....	6,739
Percussion caps.....	6
Saddlery.....	1,603
Steel.....	664
Spelter.....	55,746
Silverware.....	4
Silver ore.....	50
Tin, bxs.....	55,086
Tin, bbls.....	20
Tin, 1,733 slabs.....	111,572
Wire.....	118
Zinc.....	39,358

EXPORTS, EXCLUSIVE OF SPECIE.

For the week ended August 2:	1878.	1879.
Total for the week.....	\$8,400	
Prev. reported.....	11,598,098	

Government bonds at the close were quoted as follows:

Bid.	Asked.
U. S. Currency 6%.....	121 1/2
U. S. 6% 1830 registered.....	104 1/2
U. S. 6% 1830 coupon.....	104 1/2
U. S. 6% 1830 new registered.....	105
U. S. 6% 1831 coupon.....	104 1/2
U. S. 5% 1831 registered.....	102 1/2
U. S. 4% 1831 registered.....	104 1/2
U. S. 4% 1831 coupon.....	105 1/2
U. S. 4% 1831 registered.....	105 1/2
U. S. 4% 1837 registered.....	101 1/2
U. S. 4% 1837 coupon.....	102
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U. S. 4% 1837 coupon.....	102

The following were the closing quotations of active shares:

Bid.	Asked.
American District Telegraph.....	63 1/2
Atlantic and Pacific Telegraph.....	34 1/2
Burlington and Quincy.....	118 1/2
Caribou.....	6 1/2
Canadian Southern.....	59
Canton.....	4 1/2
Col. Chicago and Indiana Central.....	8 1/2
Cleveland and Ind......	5 1/2
Chester and Ohio.....	7
Chicago and Alton.....	95
Chic. St. Paul and Minn.....	43 1/2
Delaware, Lack. and Western.....	60 1/2
Delaware and Hudson Canal.....	40
Express-Adams.....	100 1/2
United States.....	44
Wells, Fargo & Co.....	28 1/2
Erie.....	52 1/2
Hannibal and St. Joseph.....	43 1/2
Homestake.....	92 1/2
Kansas and Texas.....	58 1/2
Lake Superior.....	16
Louisville and Nashville.....	53 1/2
Michigan Central.....	85
Morris and Essex.....	92
New Jersey Central.....	53 1/2
New Jersey Southern.....	28 1/2
Northern Pacific.....	16
Northwest.....	47
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U. S. 4% 1831 coupon.....	105 1/2
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U. S. 6% 1830 coupon.....	104 1/2
U. S. 6%	

transpired for shipment to Germany, Italy and the United States. The market here is fairly active, and about 800 tons changed hands during the week. We quote Eglington, \$20; Coltness, \$22, and Glengarnock, \$20.50, ex ship, and Gartsherrie, \$22 from yard.

Rails.—The demand for Rails—both Steel and Iron—continues, except for very distant delivery, to be greatly in excess of the visible supply. No transactions in Steel Rails are reported, and we continue to quote the same at tidewater, \$45.50 @ \$46. In Iron Rails we hear of a sale of between 1500 and 2000 tons English, for immediate importation, at about current quotations, and 1500 tons domestic at \$44, delivered at Chicago. We quote Iron Rails, at mill, \$39 @ \$40.

Old Rails.—No new business has come to our notice during the week, and we quote as before \$24 @ \$25 here.

Scrap.—We hear of considerable inquiry for Scrap Iron, and a sale of 500 tons No. 1 Wrought at \$23.75. We quote from yard, \$24.

METALS.

Copper.—Sales have been limited to 50,000 pounds Lake Superior at 16 1/4¢ @ 16 1/4¢, at which the market closes. We quote Baltimore nominally at the same figure. There has been a fresh decline in the London market, the cable quoting Chili Bars £53.10/., and Best Selected, £60. A telegram from the West Coast states that the two principal Peruvian men-of-war have appeared of the Chilean ports and have captured a cargo of Copper. There are mail accounts to hand from London dated July 26, from which we borrow the ensuing passage: "Since the commencement of the week this market has displayed a slightly different appearance, owing to the Wallaroo Copper, which was offered on the 15th inst. by public auction, having been disposed of by private contract. This is satisfactory, as it gives a healthier tone to the market, and since the sale some few transactions have been reported from £60.10/., @ £61.10/., and as the importer has bound himself not to sell again before October 15 next, it may possibly afford an opportunity for operators to turn the purchase over at a slight profit. But as the market for all other descriptions is particularly heavy, it would be advisable to turn it over on the first favorable occasion that presents itself. The market is in such a wretched state that the operators well deserve to be supported in their courageous efforts to speculate for a rise." Manufactured Copper is unchanged in price at the combination rates. We quote: New Sheathing Copper, 22¢; Braziers' 24¢, and Bolts, 24¢, Bottoms, 26¢; American Yellow Sheathing Metal, 13 1/2¢; Yellow Metal Bolts, 20¢, and English Yellow Sheathing Metal, 12¢ @ 12 1/4¢, in bond.

Tin—The market has assumed greater steadiness, and we quote, on the spot, large lines: Straits, 14 1/2¢ @ 14 1/4¢; English Re-refined, 14 1/2¢; ditto Common, 14¢ @ 14 1/4¢; and Banca, 15 1/2¢. Straits afloat may be quoted 14 1/2¢ @ 14 1/4¢. The July exports from Singapore have been 420 tons to the United States and 100 tons to England. The Singapore market, the cable informs us, is steady at a parity of about 15¢ to lay down here, and London fluctuates between £64 and £65. The deliveries here and in Europe continue to be satisfactory, and it is generally believed that with the termination of the hot season our market will advance. London, July 26: This market shows comparatively little change, and sellers maintain their quotations of last week with more firmness than could be well expected at a time when not only supplies come forward in excess of requirements, but also when stocks are very large. For the last six months there would have been most favorable opportunities for the stock of this metal to diminish had supplies been kept moderate, for during that period the consumption has been very good, and while deliveries continue on as large a scale as hitherto, importers will not be much inclined to make concessions. From time to time the deliveries have been questioned by some persons, and they have thrown a doubt upon them, and insinuated that the transhipments have been for financial purposes, and not in fulfillment of any legitimate demand; but until it is proved to the contrary, they ought to be accepted as correct. The market for Tin Plates at New York is steady and quite strong. Considering the season the demand is very active. English cable advices are equally strong. There has been an advance in Coke Tins of about a shilling in the short space of a week. This sudden improvement has arisen from reports of a threatened strike, and the news was received here by cable on Saturday last. Later despatches, however, report no further change. It should be mentioned that it is asserted quite a number of parties at New York are oversold, having made sales for future delivery, as was noted by us last week. We quote per box, ordinary brands, large lots, at the close as follows: Charcoal Bright, \$6 @ \$6.25; ditto Ternes, \$5.55 @ \$5.65—the latter after large purchases by leading firm at \$5.50 yesterday; Coke Tin, \$5, and ditto Ternes, \$4.75 @ \$5. London, July 26: The demand has somewhat fallen off, and prices show a slightly drooping tendency. At a meeting of manufacturers held at Gloucester last week it was agreed to further reduce the production, but some of the makers in South Wales have since resolved to continue the four days per week system of working."

Lead—Common Domestic Lead is quite stiff at 4.10¢. The sales effected have been small, having been from second hands at figures a little below ruling rates. The market wears a quiet aspect. We quote Re-refined 4.20¢. London, July 26: There is rather a firmer market for this metal, though the demand keeps of a limited character. English Pig is quoted from £13.10/., to £13.15/., and Smeat Lead at about £1.10/., ton above these prices. Manufacturers' prices are unchanged. We quote: Bar, 5¢; Pipe, 5 1/2¢; Sheet, 6¢; Tin-Lined Pipe, 12¢; No. 1 Solder, 10¢; all less 10¢ to the trade.

Spelter and Zinc.—Yesterday 5¢ was refused for five car loads Missouri Common Domestic Spelter. Stocks here and in the

West have dwindled down to an insignificant figure. We may cite, in confirmation of the strength of the market, the fact that offers sent from St. Louis of 4 1/2¢ were refused. Some people pretend that the advance in England has contributed its share to the stiffness prevailing on this side.

"London, July 26: This metal has rather improved in value, but prices, though somewhat stiffer, have not advanced to a much higher figure than was ruling last week." Sheet Zinc has not yet begun to fully sympathize with the advance in the raw material. We quote the same 6 1/2¢ @ 6 1/4¢.

Nickel.—This metal is moderately active at \$1.25 for Prime American.

Antimony.—A moderate demand for jobbing purposes is noticeable, but the market in general still remains featureless at 11 1/2¢.

for Haliot, and at 11 1/2¢ @ 12¢ for Cookson.

OLD METALS, PAPER STOCK, &c.

As manufacturers are not yet through taking stock, the Old Metal market still continues dull. There are no heavy stocks in the market, however, and the least activity in the demand will immediately produce a rise in prices. A good trade is anticipated after the 15th of the month. The Rag and Paper Stock market is firmer, but prices remain unchanged.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy.....	per lb. \$0.12 1/2 @	...
Copper Bottoms.....	" 10 " 10 " 10 "	...
Yellow Metal.....	" 10 " 10 " 10 "	...
Brass, heavy.....	" 10 " 10 " 10 "	...
Brass, light.....	" 10 " 10 " 10 "	...
Composition, heavy.....	" 10 " 10 " 10 "	...
Composition, solid.....	" 10 " 10 " 10 "	...
Tea Lead.....	" 10 " 10 " 10 "	...
Zinc.....	" 10 " 10 " 10 "	...
Pewter, No. 1.....	" 10 " 10 " 10 "	...
Pewter, No. 2.....	" 10 " 10 " 10 "	...
Wrought Iron.....	pr. cwt. \$5 " 10 " 10 "	...
Light do.....	" 10 " 10 " 10 "	...
Stove Plate.....	" 10 " 10 " 10 "	...
Machineries do.....	" 10 " 10 " 10 "	...

The prices current for Rags, &c., are as follows:

Canvas, Linen.....	per lb. 3 c. @ 3 1/2 c.	...
White Cotton, New.....	" 1 1/2 c. 10 " 10 "	...
White, No. 1.....	" 3 1/2 c. 10 " 10 "	...
No. 2.....	" 3 1/2 c. 10 " 10 "	...
Seconds.....	" 1 1/2 c. 10 " 10 "	...
Mixed, Woolen.....	" 3 1/2 c. 10 " 10 "	...
Soft, do.....	" 3 1/2 c. 10 " 10 "	...
Woolen Bags.....	" 3 1/2 c. 10 " 10 "	...
Wooly Bagging.....	" 3 1/2 c. 10 " 10 "	...
Kentucky Bagging.....	" 3 1/2 c. 10 " 10 "	...
Book Stock.....	" 3 1/2 c. 10 " 10 "	...
Newspapers.....	" 3 1/2 c. 10 " 10 "	...
Kentucky Bale Rope.....	" 3 1/2 c. 10 " 10 "	...
Tarred Shaking.....	" 3 1/2 c. 10 " 10 "	...
Grass Rope.....	" 3 1/2 c. 10 " 10 "	...

Messrs. Du Plaine & Co., Philadelphia, under date of August 5, quote the market prices for Old Metals as follows:

	Cents per lb.
Heavy Old Copper.....	14 " 14 1/2 "
Light Tinned Copper.....	12 " 12 1/2 "
Copper Bottoms.....	11 " 11 1/2 "
Locomotive Copper and Tin Bronze.....	12 1/2 " 13 "
Light Red Brass Scrap.....	10 1/2 " 11 "
Heavy Yellow Brass Scrap.....	10 1/2 " 11 "
Old Junk Lead (melted in mass).....	3 1/2 " 4 "
Tea Lead.....	3 1/2 " 4 "
New Zinc Clippings.....	3 1/2 " 4 "
Old Scrap Zinc.....	3 1/2 " 4 "
Old Battery Zinc.....	3 1/2 " 4 "
Plumb. Lead Joints.....	10 " 10 "
No. 1 Pewter.....	7 " 10 "
Old Type Metal.....	4 " 6 "
Red Brass Turnings.....	7 " 10 "
Yellow Brass Turnings.....	5 " 6 "
Stereotype or Electrotype Plates.....	4 " 6 "

IMPORTS

Hardware.	Order.	Cutterly, cs. 4
Bloomfield J. C. & Co.		Emery'de, tons, 148
Mds., pkgs., 27		Hdw., cs. 9
Boker H. & Co.		Hdw., cs. 18
Hdw., cs. 33		Hdw., cs. 18
Bowers William.		Hdw., cs. 18
Hdw., cs. 1		Hdw., cs. 18
de Riviera J. & Co.		Hdw., cs. 18
McKenna, box, 1		Hdw., cs. 18
Erie R. & Co.		Hdw., cs. 18
Mds., pkgs., 2		Hdw., cs. 18
North Shore Line.		Hdw., cs. 18
Mds., pkgs., 3		Hdw., cs. 18
Folsom H. & D.		Hdw., cs. 18
Guns, cs. 3		Hdw., cs. 18
Hecht Bros.		Hdw., cs. 18
Hdw., cs. 1		Hdw., cs. 18
Hewitt H. & Co.*		Hdw., cs. 18
Mds., pkgs., 17		Hdw., cs. 18
Loewi Edgar.		Hdw., cs. 18
Mart & Co.		Hdw., cs. 18
Hdw., cs. 10		Hdw., cs. 18
Mason J. W. & Co.		Hdw., cs. 18
Wire rope coils, 10		Hdw., cs. 18
McCook Co.		Hdw., cs. 18
Merchants' Dispatch Co.		Hdw., cs. 18
Arms, cs. 13		Hdw., cs. 18
Montgomery J. M.		Hdw., cs. 18
Steel wire, csks. 3		Hdw., cs. 18
Moore's John P. Sons.		Hdw., cs. 18
Arms, 10		Hdw., cs. 18
Ordnance, 10		Hdw., cs. 18
Perkins, Livingstone, Post & Co.		Hdw., cs. 18
Coal, tons, 10		Hdw., cs. 18
Priest, Page & Co.		Hdw., cs. 18
Iron castings and Machinery, 44		Hdw., cs. 18
Ranft Richard.		Hdw., cs. 18
Steel wire, cks. 1		Hdw., cs. 18
Iron goods, cks. 1		Hdw., cs. 18
Rebecker Jul. & Co.		Hdw., cs. 18
Hdw., cs. 4		Hdw., cs. 18
Rogers H.		Hdw., cs. 18
Mds., pkgs., 1		Hdw., cs. 18
Schoverding, Daly & Gales.		Hdw., cs. 18
Tubs for barrels, 10		Hdw., cs. 18
Arms, cs. 6		Hdw., cs. 18
Mds., pkgs., 2		Hdw., cs. 18
Shuyler, Hartley & Graham.		Hdw., cs. 18
Mds., pkgs., 1		Hdw., cs. 18
Spelman Bros.		Hdw., cs. 18
Hdw., cs. 3		Hdw., cs. 18
Squires H. C.		Hdw., cs. 18
Guns, cs. 4		Hdw., cs. 18
Stanier & Laffey.		Hdw., cs. 18
Wire, cs. 1		Hdw., cs. 18
Stewart A. T. & Co.		Hdw., cs. 18
Machinery, cs. 19		Hdw., cs. 18
Double barrels, cs. 2		Hdw., cs. 18
Sturller Lau & Co.		Hdw., cs. 18
Arms, cs. 11		Hdw., cs. 18
Thompson L. G.		Hdw., cs. 18
Telegraph wire, lots, 73		Hdw., cs. 18
Ward Asline.		Hdw., cs. 18
Cutterl., pkgs., 5		Hdw., cs. 18
Wetzlar M.		Hdw., cs. 18
Mds., pkgs., 1		Hdw., cs. 18
Wibsch & Hilger Hdw. Co.		Hdw., cs. 18
Cutterl., hdw. and steel, pkgs., 317		Hdw., cs. 18
Hdw., cs. 8		Hdw., cs. 18
Witte J. G. & Co.		Hdw., cs. 18
Wolf H. & Co.		Hdw., cs. 18
Mds., pkgs., 2		Hdw., cs. 18

Spelter and Zinc.

Yesterday 5¢ was refused for five car loads Missouri Common Domestic Spelter. Stocks here and in the

EXPORTS

of writing this. The *Ironmonger* states that especial attention will be devoted to all kinds of agricultural implements, machinery and tools, so that your trade ought not to overlook the gathering.

THE BELGIAN EXHIBITION

of 1850, at Brussels, had been intended to be purely national, but there now appears to be some likelihood of its being converted into an international one—at all events, so far as agricultural machinery is in question. Farming in Flanders, Brabant, &c., is still conducted in a very primitive way, so that improved implements and appliances should meet the requirements of *les braves Belges*.

FROM BIRMINGHAM, SHEFFIELD,

and the other leading hardware centers the news of the week has been so monotonously dreary and devoid of features of interest that I shall not venture to repeat it. At Birmingham there appears to be quite an average turnover in the hardware trades, but money is dreadfully scarce, and current orders yield hardly any profit at all. At Sheffield matters are worse even than that, for there are scarcely any orders in the market. Business does not improve there in the slightest degree, and all correspondence thence, as well as oral communications, are in unison in declaring that a more grave state of things has never been known for half a century past. A bad harvest and severe winter will be most serious for Sheffield. Even there, nevertheless, enterprise has had its reward, for it is recorded that houses who have diligently opened up new foreign and colonial markets are much better employed, comparatively speaking, than those who have blindly adhered to the old beaten tracks and to the home trade only.

FOREIGN.

FRANCE.

(*Moniteur des Intérêts Matériels*.)

PARIS, July 20, 1879.—**Metals.**—There is no improvement noticeable as yet in the general aspect of business affairs. The weather is unpropitious and crop production is bad. *Copper* is in decline. There is a decline of 1.50 francs in Imports and Slabs 1.50 @ 2 in Bars, and 2.50 in pure Corocoro Ore. We quote: *Chili Bars*, 144.25 @ 148.75; *Ingots and Slabs*, 150; *Best Selected*, 155, and pure Corocoro Ore, 152.50. *Havre* is nominal; *Chili Bars* there, 143.75 @ 147.50 francs the 100 kilos. There is a decline of 2.50 francs at Marseilles, where they quote small *Refined Irons*, 150.50; *Sheet Zinc*, 150; *Sheathing and Bolts*, 150, and *Yellow Metal Sheathing*, 170. *Tin*, *Banca Tin* is held more firmly, but there is a giving way of 1 franc in Australian and of 1.50 in English. We quote at Paris: *Banca*, 175; *English* at Havre or Rouen, 165, and the remaining sorts, 174. *Marseilles* is quiet, but *Banca* has improved there 5 francs. They quote 1.50 sorts in *English*, 175, and the latter, 170. *Lead*.—This metal has a slight request and without change. We quote the same, 13.50 @ 1.50 francs the 100 kilos, and *Manufactured*, 140. *Havre* is steady at 35.50 @ 36 francs for *First Fashion* Soft Spanish. Prices are weak at a fresh decline of 1.50 @ 1 franc at Marseilles, where the quotation ranges between 31.50 and 33 francs, and *Antimonious*, 31; *Sheet and Pipe*, 36.50, and *Shot*, 37. *Spelter*.—There is very little doing there at all. There is a slight decline of 1.50 francs. *Sheet Zinc*, 150 francs. *Havre* is firm after a decline of 1.50. They quote *Silesian*, 38.50 @ 1 franc. *Sheet Zinc* is a franc lower at Marseilles, where it sells at 11 @ 12 francs, and *Old Remelted* at 24. *Iron*.—Little change is reported in the general situation. Dealers who have been buying on an extensive scale during the past four weeks, seem inclined to hold for a while. There is, however, too much inherent strength in the French markets, and an interval of quiet is therefore not likely to produce much of a decline immediately. It should be remarked, however, that at the North prices are stiffer than they are elsewhere in France. Thus, *Merchant Iron* commands at the North 16.50 francs; *Puddled Iron*, 22. *In the Mende and Mօselle* German companies weigh rather heavily on the market, and keep down *Grey Affinage* *Pig Iron* at 10.50, and *Charcoal*, 76.50. In the *Haute-Marne* Sheet Iron *Coke* of the first class remains at 160 @ 170; *Mixed*, 150 @ 160; *first quality Charcoal*, 215 @ 220; *Special Iron* first category, 160 @ 170; *Machine*, No. 20, *Coke*, 170 @ 175; *thin Sheets, first category*, *Coke*, 180 @ 190; *Wire*, No. 20, 170 @ 180; *Brass* and *Chain*, 160 @ 170; and *Nails*, No. 18, 150 @ 160. There is no change reported in the *Loire* and *Rhone* *Casins* since the last *Navy* adjudications. Producers there are taking their inventory, but as the *State* lines will require 20,000 tons of rails there will soon be more activity infused into that region. *Coal*.—There is little of interest to be reported for the week. Prices generally are steady, and since the adjudications for furnishing *Coal* to the government, which took place the other day in Belgium, the general feeling has been that both the Belgian and French market may give way.

BELGIUM.

(*Revue Universelle*.)

BRUSSELS, July 20, 1879.—*Iron*.—The first seven months of the year are now drawing to a close, and on reviewing them it cannot be denied that, so far as Belgian industry is concerned, they have proved a decided disappointment. When the *Revival* was inaugurated in France in this branch in consequence of the demand for the navy, railroads and building, it was very much hoped that the movement would meet with a corresponding response in this country, and that a brisk season would have opened during the spring and summer. These wishes have not been realized, and the hope has not been disproved, but in our own resources. Fortunately there has been a disappointment as regards a more general revival, if it cannot be said that we have not had a steady, moderate run of orders at very low prices. Our producers have had work, but at prices which will leave them whole, and no more. For any work beyond this their ironmasters have had to look to the more distant foreign countries, and as to the trade requires, above everything else, time to build it up, there has been of course but a partial success, yet sufficiently so to encourage further efforts in that direction. The new German tariff will tend to quiet our dealings with these neighbors of ours at least for a while. Later on we expect to do as much business with them as ever. *Coal*.—A very quiet mood prevails in this branch, and the tendency if anything is slightly downward.

GERMANY.

(*Borsenblatt*.)

HAMBURG, July 19, 1879.—**Metals**.—A moderate amount of activity has prevailed during the week, dealers and consumers again holding back in consequence of the weak attitude of the market, where imports of *Metals* continue in excess of the demands there, hence consequently stocks still accumulate. Our consumers, perceiving the still drooping tendency there, have again become sly, and limit their purchases to actual requirements, in hopes of buying cheaper by the time their wants again oblige them to recur to the market. This spirit of caution does not fail to make an impression upon dealers, who to themselves have also given a certain hold. Holders at the ports and government warehouses, although not pressing their goods upon customers—which would be useless—certainly limit their operations, and the importer will thus have to display some patience till the English and Dutch markets return to a more stable condition and once more inspire confidence. *Copper*.—We are steady here, following Dutch market, and marks the 100 kilos. *Minnesota*, 84. *Hedda*, 71, and *Tonawanda*, 64. *Tin* has remained unaltered, orders being held in check by the continual slight fluctuations in England and Holland. *Lead*.—We have remained quiet here and quote at the

close as follows: *English Pig*, 15 @ 15.50; *German* *ditto*, 14 @ 14.50; *Spanish Argentiferous*, 15.50. *Spelter*.—The former feeling here has not abated, but no actual advance is as yet established. We quote *Silesian*, 14.50 @ 15.

HOLLAND

(*Koch & Vlieboom*.)

ROTTERDAM, July 22, 1879.—**Prices**.—Prices have remained nearly stationary during the week. Holders are generally firm in view of the steadiness and magnitude of the demand. Yet the improvement in prospect, for the arrivals are all along in excess of requirements, and there is, consequently, no decrease perceptible in stocks here and in England. We quote: *Banca*, 38.50 *guldens* the 50 kilos.; and *Bililon and Australian*, 37.75. Pending the Company's sale, to come off in about a week from now, not much business will be done in *Tin* in this vicinity. Thenceforward much will depend upon the general developments in trade.

EAST INDIES.

(*Gilligan, Wood & Co.*)

SINGAPORE, June 18, 1879.—*Tin*.—Supplies have not been large, and the demand for the United States having improved, the price has advanced to \$2.25 per picul. The shipments during the past fortnight from the Straits to the United States have been 100 tons, and by steamers to London have been 22 tons, and are now about 200 tons waiting for shipment. *Tinage*.—There has not been any change in rates, but there are few free vessels in port, and cargo is accumulating for London, Liverpool and the Continent, and we think an early advance in freights probable. For New York a large business has been done. Three vessels the C. L. Pearson, Mystery and *Saint A. V. Vassilieff*, have taken the berth, and have nearly all engaged full cargoes. *Tin*.—*Nehemiah Gibson* has cleared, having no *Tin* on board, while the *Afghan*, for New York via London, took 1260 piculs. Exports from the Straits Settlements to the United States during the first five months have been 38,688 piculs, against 20,127 last year, 25,630 in 1877, 17,066 in 1876, 25,646 in 1875, 19,433 in 1874, 14,750 in 1873, 23,146 in 1872, 21,107 in 1871, and 21,878 in 1870. *Exchange*.—Rates have remained unaltered.

MINING AND MINERAL ITEMS.

COAL.

There is no prospect of resumption of work at the coal mines on the Monongahela River, as was at first hoped, owing to the recent rise and the large shipments South. The operators state that the coal on the way South cannot be sent further than Cincinnati and Louisville on this rise, and unless there is more rain and high rivers the barges cannot be returned for use for some time.

Coke ovens are to be built at the Laurel Run Mine, in Centre County. These will be the first ovens erected in that neighborhood.

The collieries in the neighborhood of Osceola, Pa., are all running with one exception, and it was to be put in operation the first of the month.

The Pratt Coal and Coke Company, of Birmingham, Ala., are to have built for them 200 coke ovens near the mines, to be completed as soon as practicable. This company recently contracted to deliver 50,000 tons of their coal at Vicksburg for Mississippi River steamers.

The coal shipments from the Clearfield, Pa., region for the week ending July 19 were 33,846 tons, an increase over the same week last year of 40,840 tons. The total shipments since the 1st of January from this region were 805,530 tons, against 683,881 tons for the same time last year, showing an increase this year of 131,650 tons.

IRON.

We condense the following from the *Marquette Mining Journal*: Marquette is considerably (53,743 tons) behind in ore shipments, as compared with 1878, while Escanaba is nearly, if not quite, that much ahead. Escanaba still leads Marquette in 37,504 tons in the amount of lake shipments, a gain of only 495 tons for Marquette during the week ending July 23. Total lake shipments from the district up to July 23 footed 50,001 gross tons, an increase of 14,075 tons over a corresponding period last year. Combined, the two iron districts turned the half million corner in the matter of shipments the past week. This indicates a total output of over 1,000,000 tons in 1879. At the New York mine there will be little, if any, decrease of product in consequence of the recent heavy fall of rock. The shipments of iron ore over the C. & N. W. Railway on Saturday last from the Menominee range mines alone were 498 cars, being considerably more than was shipped from Negaunee and Ishpeming over the same road, and it wasn't a very good day for shipping ore, either. There was hauled into Escanaba on Saturday last, over the C. & N. W. Railway, from the Menominee and Marquette country districts, no less than 1265 cars of ore, aggregating a total tonnage of nearly, if not quite, 9000 tons.

The farmers living near the mouth of Montour's run, a little stream which empties into the Ohio about eight miles below Pittsburgh, are greatly excited about an alleged discovery of iron ore in that section. Youngstown and Cleveland iron men have been prospecting about the place for two or three weeks, and a Cleveland man has succeeded in leasing a five-acre piece of the farm of Mr. John Scott for \$3000. It is stated an offer of \$10,000 was also made to Alex. Stewart, another farmer in the vicinity, for the lease of 20 acres from his farm, but he declined the offer. The farmers near Ewing's mill are also prospecting, and all about the vicinity the farmers are intensely excited about the discovery, and are asking fabulous prices for their land. The Montour Run Railroad, a branch of the Pittsburgh and Lake Erie road, traverses the section.

The Republic Mine does not appear to be doing as well in the way of shipping this season as last, having shipped only 61,469 tons up to and including July 23, as compared with 107,108 tons during a corresponding period last year—a falling off of 45,739 tons.

Promising Belgian Ore Deposit.—The *Moniteur Industriel* describes a deposit of manganese iron ore which is known to exist at Rahier (Amblève), Belgium. Four outcrops, probably produced by the faulting of one bed, have been examined, and the following analyses have been obtained of minerals found at some depth:

	Percent
Silica	12.93
Metalliferous iron	18.01
Manganese	22.30
Lime	3.56
Alumina	1.23
Magnesia	0.21
Phosphorus	0.21
Carbonic acid	20.39

Oil Producers' Troubles.

The oil producers of the Bradford region are said to be very much excited over the action of the United Pipe Line Company in renewing its "immediate shipment" plan. Under this plan the company declines to transport the oil of producers, or even to run their oil into storage tanks, unless it is first sold to them for immediate shipment at a reduction of ten cents per barrel from the regular rates. Under this rule those producers who are unwilling to comply with the producers' facilities for removing their oil, and in numbers of cases the tanks are overflowing and the oil running to waste. The individual operators contend that if the United Pipe Lines can transport the oil if sold to them, it can equally forward it to its destination for the producers. The producers held a mass meeting at Bradford and adopted the following resolution:

"That the oil producers of the Northern District, in mass meeting assembled, do maintain and declare that the present immediate shipment order is infamous in principle and disreputable in practice, and we hereby declare we will not sell one barrel of oil in conformity with the requirement of said order, and we pledge 'our lives, our fortunes and our sacred honor' to resort to every legal means and to use every influence in our power to prevent any sales under said order, and we also demand that the United Pipe Lines shall hereafter perform their duties as common carriers under the law."

The feeling in the district runs very high, and the producers seem determined to check this latest move on the part of the monopoly. As matters now stand, there is no foretelling how the affair may end, unless the obnoxious order is withdrawn and the old system readopted.

Oil is now transported from the oil region at lower rates than ever before. The highest figure ever reached for railroad transportation and local pipeage to Philadelphia was \$3.15 per barrel. This was several years ago. Then it came down to \$1.55 for the railroads and 30 cents for the pipe lines, and later still \$1.25 and 20 cents. Since the *Tidewater* Pipe Line was put into successful operation the rates have been reduced to 25 cents for railroad transportation and five cents for the pipe line accommodation.

Two thousand barrels of oil are now reaching Philadelphia weekly via the *Tidewater* Pipe Line and the Reading Railroad. The whole consignments go to the works of the Pennsylvania Refining Company at Greenwich Point. In about 30 days the new refinery at Gibson's Point will be completed, and the shipments to Philadelphia will be considerably increased. New refineries are also in course of construction at Williamsport and this city, which will be fed through the new line.

LABOR AND WAGES.

President *pro tem.* *Keim*, of the Philadelphia and Reading Coal and Iron Company, announces an increase of 4 per cent. to the miners' wages. This action fixes the rate of wages to be paid to all the operators in Schuylkill County.

The miners at the Churchill and Kline mines, near Youngstown, Ohio, struck on Friday for an advance of 10 cents per ton. About 5000 men are employed in these mines. Meetings of miners were held on Saturday throughout the Mahoning Valley, and it is feared there will be a general strike, in which event about 8000 miners will be idle.

The advance in wages to the workmen at the Kensington Rolling Mill, Philadelphia, is 10 per cent., and not 40 per cent. as erroneously reported in the Philadelphia papers.

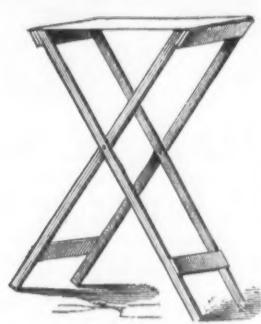
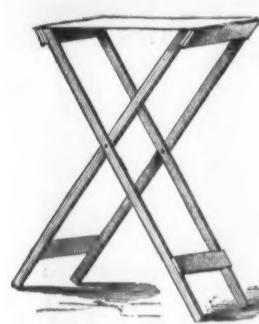
The New Haven manufacturers cannot get hands enough to do their work, and some of them are so busy that they have to refuse orders that come to them. One concern recently refused a \$40,000 order from Russia for 140 platform cars to be fitted with oil tanks, as they had too much work on hand. The corset manufacturers are especially bothered about finding girls enough to do their work, and one of them is writing about the country for this class of help. The carriage makers also are having more work than for some years past.

The Fall River strikers as a body have shown their good sense by refusing to furnish bail for those of their number who have been arrested for resorting to violence. If they had countenanced the assaults that have been made by individuals on workers in the mills, they would have lost all claim to public respect or sympathy. As it is, they cannot be blamed for the foolish and unwarrantable acts of the few strikers who, in asserting their own right to make terms with their employers, seek to deny the same right to others.

Paving by Steam.—Samuel Johnson, who has contracted with the Highway Department for paving Paschal street, in West Philadelphia, for some nine or ten squares eastward from its intersection with Haverford road, is doing the ramming part of the work with a steam paving machine, patented by himself. This machine, which is managed by two men, is said to do as much ramming in a day as could be done by six men with the old style rammer, its capacity being 800 square yards per day. In appearance it resembles a steam fire engine, but has on one end an iron crane moving over a semicircle of about 10 feet. This crane carries a steam hammer which moves up and down precisely as the steam hammer used in iron foundries, its force being moderated by a workman, who at the same time moves the crane right or left at each blow, while another workman, by levers and steam power, changes the position of the engine backward or forward as occasion requires.

The hammer can be made to strike with a force of 1500 pounds. The engine now at work on Paschal street, the first ever built for this purpose, is unnecessarily heavy, weighing 6½ tons. An evidence of its working power in forcing the rubble pavement into the gravel bed, lies in the fact that the heavy weight of the engine when moved over work that has once been rammed, makes no impression on it. The rubble pavement, now being placed on Paschal street differs from any heretofore laid in Philadelphia, the stones being split

to a width of two or three inches, and set on edge, the ordinary rubble pavement being made of blocks of all shapes and sizes, broken by hammers at the quarry. The machine in question has been experimentally tried on the ordinary cobble stone, and on Belgian block pavements, and it is claimed to work well in both cases. It carries supplies of water and coal sufficient for two or three hours' work, and being independent of horse power, when the water runs low in the tank, it may be moved by its own power to the nearest pump.

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JULIUS MORISSE, 813 N. 4th st., St. Louis, Mo.

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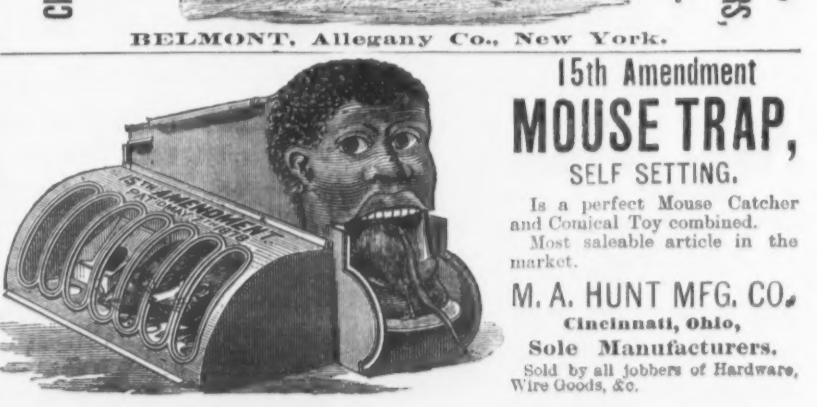
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The Steel Rail Trade of France and the Protective Tariff.

A number of important establishments in France, among others Creusot, Terre-Noire, Denain et Anzin, Marine, Châtillon, Commeny-Fourchambault, Firminy, St. Etienne, have entered a protest against the new tariff in contemplation. The data upon which this protest is based reveal a very remarkable state of affairs, even if allowance is made for the fact that the representations are made with the object of inducing the government to come to the aid of the steel rail trade. According to the general tariff the duty on steel rails is 360 francs (\$69.48) per metric ton, but the actual duty under the special tariff is 90 francs (\$17.37), while 60 francs (\$11.58) is the figure to which it is to be reduced by the new general tariff. French steel makers demand now, as they did in February and June, 1878, before the Legislative committees, that no general or special tariff be passed containing a duty of less than 90 francs (\$17.37) per ton of steel rails. It has been urged by their opponents that 60 francs were admitted to be sufficient by the Board of Trade in March and July, 1876, and it is the reply of the steel makers, reviewing the course of the business since that time, that in general interest as showing the rapid decline of prices and the energy of foreign competitors, notably the English. In 1876 English steel rails were quoted at works or free on board at from £7. 5/ to £8. 10/ (\$35.09 to \$41.14), or an average of \$38.11. Adding to this 10 francs (\$1.03) for ocean freight and 60 francs (\$11.58) for duty, the price of foreign rails reached about 270 francs (\$52.11), so that the market was held by the French makers, who by home competition had carried the price as low as 245 francs (\$47.28). In 1877 and 1878 prices continued to decline in England, falling successively from 175 to 137.50 francs (\$33.76 to \$26.54) at the works or free on board in England.

In February, 1878, German and Belgian, as well as English makers, sold at 150 francs (\$28.95) at works and at \$31.84, delivered in Spain and Italy. In June, 1878, these figures had fallen to 130 and 150 francs (\$25.09 and \$28.95) respectively. In 1879 the market grew worse still. On the 5th of May the Serina Works sold 11,000 tons of rails to the Upper Italian Railway at 125 francs (\$24.70), delivered at Genoa, while in June they offered light rails at \$10.36 to \$20.57. Taking the freight to Bordeaux at 12.5 francs (\$2.41) and the duty at 90 francs (\$17.37) this carries them into France at a price of 202 to 209 francs (\$38 to \$40). With a duty of 60 francs (\$11.58) foreign makers would be able to sell their product in France at from 1.70 to 1.75 francs (\$32.61 to \$33.57). This the French works claim to be unable to compete with, as these figures represent, deducting average freight, 150 to 160 francs (\$28.95 to \$30.88) at works. A minimum of 90 francs must, therefore, be retained as duty. There is no danger, they say, of any excessive rates for rails under such protection as home competition, the impossibility of exporting, and the existence of a plant sufficient to meet any increase of consumption, make an unreasonable rise impossible. They point to the trade which home industry secures for the railways, and state that the cost of making steel rails in France is considerably higher than the prices given in the above. Taking the principal producing district, the Loire, as an example, the returns of cost place it at 192.50 francs (\$37.16) exclusive of profit. To this an average of 18 francs (\$3.47) should be added for freight, so that the net cost to the producers is as much as 210.50 francs (\$40.63).

Brazilian News.—Recent advices from Rio contain the following: A bill providing that, in case of bankruptcy, creditors who are notified and do not appear personally or by their representatives at the meeting of creditors, shall be considered as adherents to the base of settlement adopted at said meeting, providing that it represents two-thirds of the indebtedness subject to such settlement, has passed the second reading in the Chamber. The last report of the Ministry of Agriculture gives 1707 miles as the total length of Brazilian railways now in traffic. This extent comprises 30 different lines. The longest line is the Don Pedro II Railway, a government road, which has at present 355 miles in traffic. This is an increase of 20 miles over the length of last year, and is due to the completion of a branch built expressly for carrying fresh meat from the new abattoir, lately erected by the government, to the city of Rio de Janeiro. The second longest line is the São Paulo and Rio de Janeiro Railway, which is 143 miles in length. The definite organization of the permanent exposition of American products at the Glette Skating Rink has been accomplished. It is designed to procure a full line of American inventions, manufactures and other productions, in order that buyers may see their advantages much better than can be done through the medium of catalogues. The parties having the enterprise in charge here are Messrs. Frederick Glette, Peter Kurczyn and H. E. Hargreaves. Mr. Kurczyn goes to the United States on Colorado to complete arrangements for procuring a full line of exhibits. In the meantime we presume the other exhibition, to be held at the Typographia National, will go on as usual. It looks a little like overdoing the exhibition business.

Charges for Delivering Coal.—The following circular has been issued by the Philadelphia and Reading Railroad Company: On and after Friday, Aug. 1, 1879, and at the option of the shipper, the freight and tolls upon anthracite by canal from Schuylkill Haven to New York Harbor, to points upon the Hudson River, or to points upon Long Island Sound, exclusive of the charge of towing from New York city, will be 53 per cent. of the price at which said coal is sold alongside at the point of delivery, except for the pea coal, for which the rate will be 70 per cent., it being provided that if the coal is sent in private or leased boats, no higher rate of freight will be taken into account than that current in company's line boats; and provided, further that the

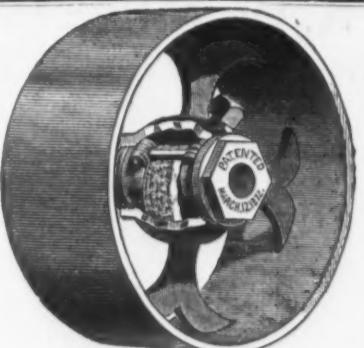
above drawbacks will be duly paid upon strict compliance in all details with the rules and regulations pertaining thereto, issued by the secretary of the company.

Contract for the Pennsylvania Railroad Grain Elevator.—We have already spoken of preparations for the construction of two enormous grain elevators, one for the Erie and another for the Pennsylvania Railroad Co. The Philadelphia *North American* of yesterday has the following: Messrs. Malster & Reaney, lessees of the Baltimore Dry Dock, have received, over bidders from Philadelphia, New York and other cities, the contract for the construction of a grain elevator at Harsimus Cove, Jersey City, for the Pennsylvania Railroad Company. It will be the largest elevator ever built, its dimensions being: Length, 203 feet; width, 145 feet 2 inches; height, 176 feet. There will be 24 of the elevators, each with a capacity for handling 6000 bushels of grain an hour. Complete cleaning machines will also be erected as a part of the system, and cars will be unloaded by steam shovels. Conveyors will deliver the grain aboard of vessels at the piers, and one of them will require a belt 2600 feet long and 36 inches wide, the largest belt in the world. The whole machinery will be driven by three engines, each having 300 indicated horse power. The elevator will be of the same design as Canton Elevator No. 1, which was built in 1875 for the Northern Central Railway Company, and the estimated cost of the entire structure, which is to be completed within eight months, is \$1,400,000.

Operations at South Pittsburg.—The Southern States Coal, Iron and Land Company's furnace is in successful blast and making a remarkably high grade of pig. The iron is low in silicon and phosphorus, being among the very best cold-short irons produced in the Chattanooga district. The company lately refused an order for 7000 tons of mill. Prices have advanced. The best quotations for mill have been \$13 to \$14, which the company have advanced 50c. to \$1, and find no difficulty in booking orders at the new rates. The furnace is now making 60 tons per day. In the month of June the total output was 1272 tons, 700 tons of which was foundry. The ores used are selected fossil from Wells Valley, Georgia, and other points, with a small percentage of brown hematite from the line of the Selina, Rome and Dalton Railroad. The fuel is from the Sewanee ovens. The blast is about three pounds average pressure. The iron is mostly marketed in Cincinnati, St. Louis, Terre Haute and Louisville, and is a favorite with stove founders. The iron is also sold in considerable quantities to Southern foundries and mills. The company use a considerable amount of the product in their extensive foundry and machine shops.

Advices from Italy indicate that the effort to introduce American anthracite into the markets of that country are likely to be successful. Mr. Crosby, our consul at Florence, in a dispatch to the Department of State, reports that a successful trial of anthracite coal has been made in Italian locomotives. One company has ordered 20,000 tons from the Philadelphia and Reading Railroad Company. Our consul at Naples has just reported a favorable experiment in the use of American coal in smelting furnaces in that city. The locomotive from this country, exhibited at the Paris Exposition, was recently sent to Milan for trial, having been refused at Florence. Great opposition is made to it by Belgian and English makers of locomotives. There is now a prospect that it may have a trial. The Reading Railroad company are preparing to furnish as large a supply as the Italian markets may require.

The Porter-Alten engine is coming into favor for rolling mill purposes. Mr. Porter has now in hand one 28 by 48 inch and also one 32 by 48 inch for the National Tube Works Company; one 40 by 48 inch for the Cambria Iron Co., and one 28 by 48 inch for the Laclede Rolling Mills of St. Louis, all to make about 100 revolutions per minute, giving 800 feet of piston travel. He has also contracted with the Albany and Rensselaer Iron and Steel Company to supply, for their new wire rod train, an engine 22 by 36 inches, to make 200 revolutions per minute, giving to the piston the great speed of 1200 feet per minute. The superiority of the positive motion, variable cut-off, and the advantage of connecting the engine directly with the train, seem to be highly appreciated. The last-named engine will be the fourth engine that Mr. Porter has made for the Albany and Rensselaer Iron and Steel Works.



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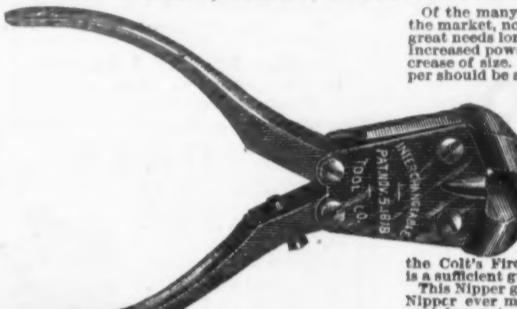
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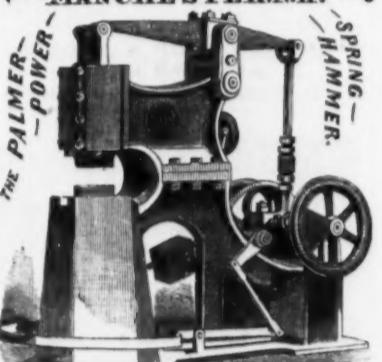
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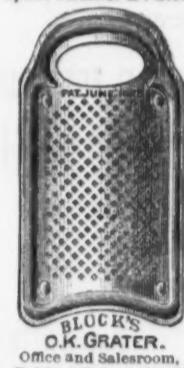
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Spencer J. & Sons, 82 Beckman, England.	16
Fire Brick.	
Borgert & O'Brien, Philadelphia.	28
Brown Bros. and Fire Brick Works, 100 Chambers, N. Y.	28
Dyke S. Brooklyn, N. Y.	28
Gardner Brothers, Pittsburgh, Pa.	28
Kreischer B. & Sons, 98 Greenwich, N. Y.	2
Newton & Co., 90 Albany, N. Y.	2
Ostrander James & Son, Troy, N. Y.	2
Perth Amboy Terra Cotta Co., Perth Amboy, N. J.	2
Porter T. W., 172 and 174 Broad, Phila.	28
Spencer J. & Sons, 82 Beckman, England.	16
Fire Brick.	
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Dyke S. Brooklyn, N. Y.	28
Gardner Brothers, Pittsburgh, Pa.	28
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and others. Fire Mortar, Ground Brick, Clay and
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from my own mines at New Jersey and Staten
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In 3½ in. to 10 in.
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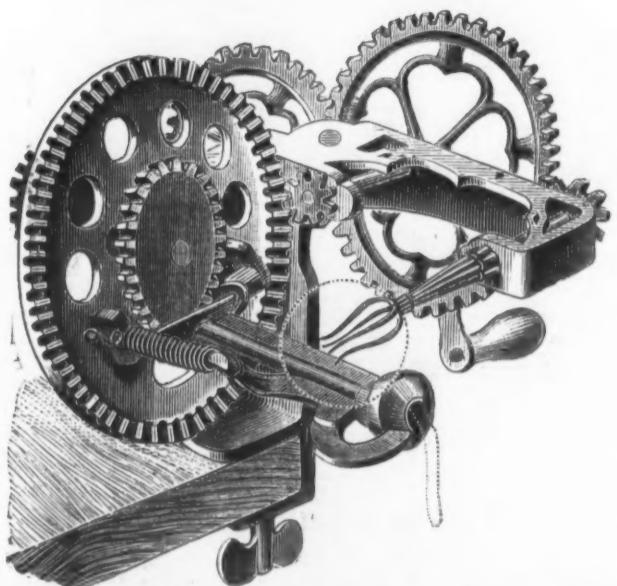
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The Rotary Diamond Grater, Monroe's Melting Ladles, and sundry articles in light Hardware.



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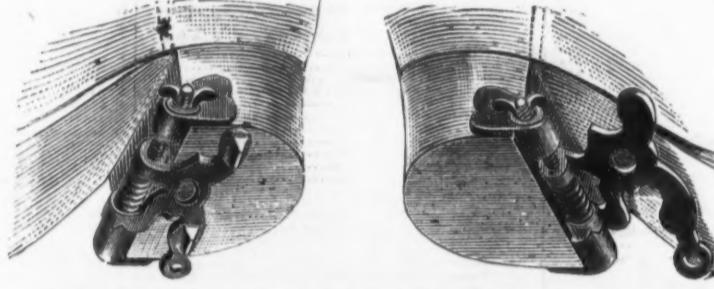
The only Machine that has ever Pared Peaches Successfully.

Letter from the Eric Preserving Company.

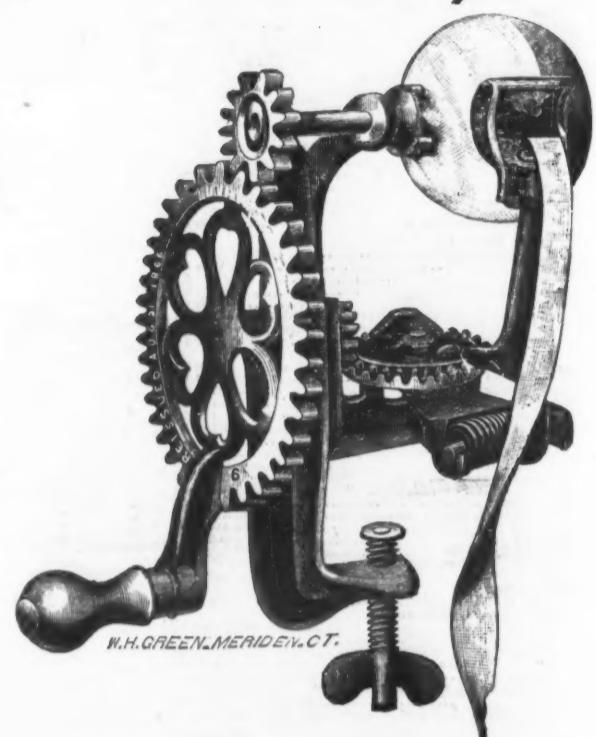
NEW YORK CITY, Aug. 26, 1870.
MESSRS. R. P. SCOTT & CO.—Gentlemen: We have been using one dozen of your Rotary Knife Peach and Apple Parers in our factory for the last fortnight, and find them to work very satisfactorily, doing the work expeditiously and well. We ordered six dozen more yesterday for our Buffalo factory. Respectfully yours,

S. FENTON, Jr., Asst. Treas.

NEW YORK PIE BAKING COMPANY.
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MESSRS. R. P. SCOTT & CO.—Gentlemen: We have used your Rotary Knife Peach Parer in our Bakery and find it to be the best machine of the kind we have ever used. We think it is about perfect. Yours, The New York Pie Baking Co.



THE SAFETY REVERSIBLE ICE CREEPERS.



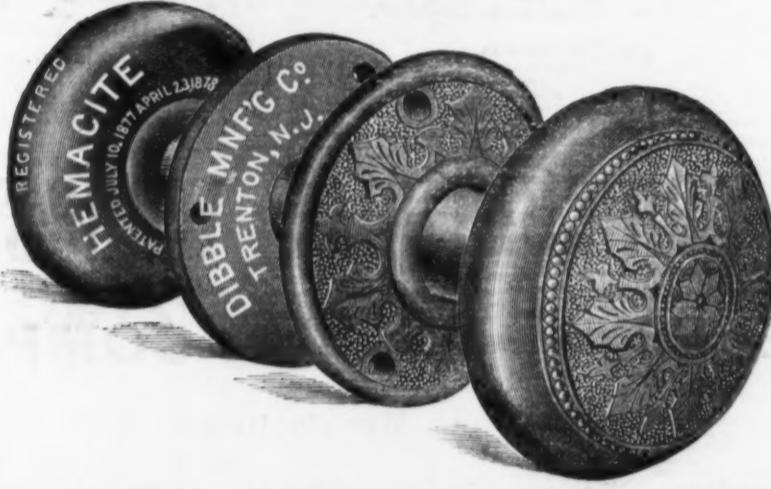
GOLD MEDAL APPLE PARER,

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The Lowest Priced First-class Apple Parer in the Market.

The only successful machine with a quick return movement of knife. Packs the best for export. Uses a curved knife and pares close to the stem by a simple and complete arrangement of the knife gear. Parings fall clear of gearing. Send for testin onials of fruit packers.

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PRICE LISTS ON APPLICATION.

These Knobs being light, do not wear the locks. They are at the same time exceedingly strong and handsome. We guarantee them to stand as long as the doors in any interior situation.

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SPRING BUTTS

For Screen Doors.

The Latest and Best. Investigate before you purchase. Thousands of Pairs already in use and giving universal satisfaction.

POUNDS OF SUPERIORITY.

These Spring Butts differ in principle from all others, having a spiral spring for power and toggles for levers, in combination, and when applied to the leaves of the Butts, exert their greatest force when the door is closed.

1. They give, by actual test, 90 per cent. more power at closing point than at right angle, and the pressure is withdrawn 50 per cent. in swinging the door from closing point 14 inches, and grows proportionately less till a point past the right angle is reached, where the action of the spring ceases altogether and the door remains at rest.

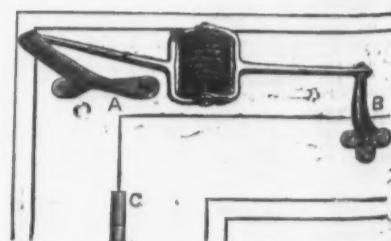
2. From this point the spring works equally well in either direction, and if the door is opened backward it is firmly retained against the wall.

3. It is impossible to strain the spring, as there is not more than 40 per cent. of the elasticity of it used.

4. The bearing joints are faced with hardened steel, which is much superior to common cast iron or brass, both in regard to friction and durability.

5. These Butts are so constructed that there is no left or right hand.

We also furnish Butts for any sized doors.

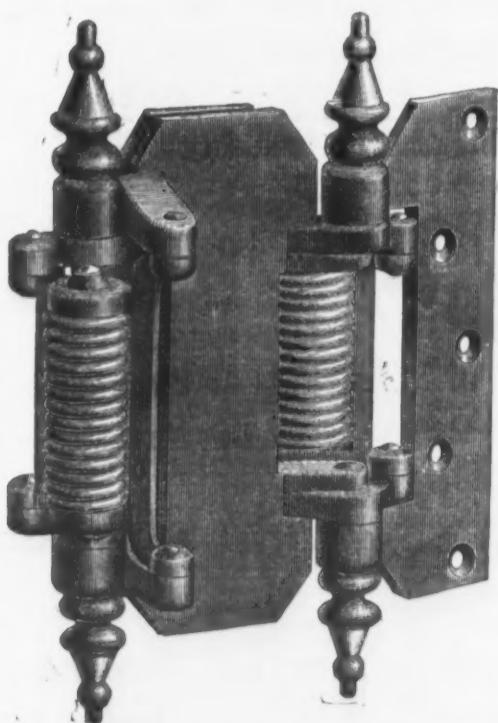


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New principle, distinct from all others. Holds the door open as well as shut. Exerts its greatest force at the closing point. For Screen Doors would recommend our No. 5. Price to suit the times. Large quantities in use, and giving universal satisfaction.

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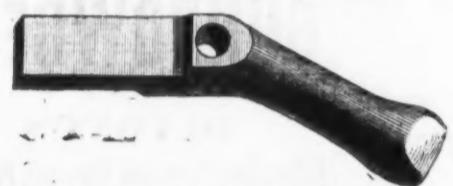
Made under letters patent of Oct. 22, 1873 and Dec. 21, 1874. Four sizes: $\frac{3}{8}$, 7-16, $\frac{1}{2}$ and 9-16 in. Two dozen in a box.

STRAIGHT STAY-END TIE.



Made for $\frac{3}{8}$, 7-16, $\frac{1}{2}$ and 9-16 in. Stays from best Norway Iron. The shape is such that it can be used with Round or Oval Stays. The back hole can be drilled to fit any size of axle. Two dozen in a box.

BENT STAY-END TIE.



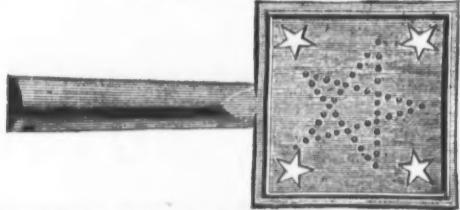
Made for $\frac{3}{8}$, 7-16, $\frac{1}{2}$ and 9-16 in. Stays from best Norway Iron. The shape is such that it can be used with Round or Oval Stays. The back hole can be drilled to fit any size of axle. Two dozen in a box.

No. 4, NEW STAY-END.



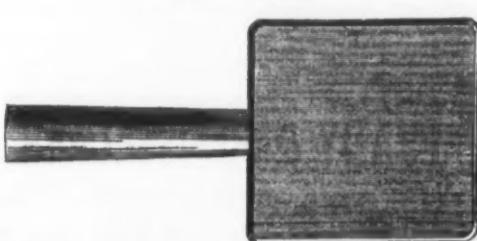
Made from best Norway Iron, under letters patent of Sept. 1, 1874. Desirable for plain work. Four sizes. Two dozen in a box.

OPEN STAR STEP.



Forged from best Norway Iron. Three sizes: No. 1, $\frac{3}{8} \times \frac{3}{8}$; No. 2, $\frac{3}{8} \times \frac{3}{8}$; No. 3, $\frac{4}{8} \times \frac{4}{8}$ in. Made under patent of April 11, 1876. Also made without open stars in corners.

PLAIN STEP.



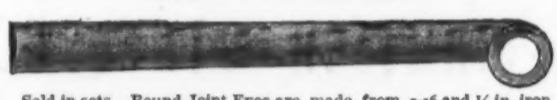
Made from best Refined Iron. The cheapest and best Plain Step made. Three sizes: $3 \times \frac{3}{8}$, $3 \frac{1}{2} \times \frac{3}{8}$, and $4 \times \frac{3}{8}$ in.

SHORT JOINT EYES.



Round or Oval, $\frac{3}{8}$ to 9-16 in. hole for prop. Four dozen in a box.

LONG JOINT EYES.



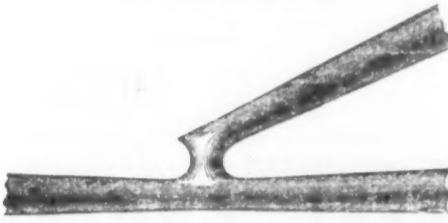
Sold in sets. Round Joint Eyes are made from 7-16 and $\frac{1}{2}$ in. iron. Oval Joint Eyes from $\frac{1}{2}$, 9-16, $\frac{3}{8}$, $\frac{3}{4}$ in. iron. Size of hole for prop, $\frac{3}{8}$ to 9-16 inch. In ordering, state what prop you use.

No. 1, STAY-END.



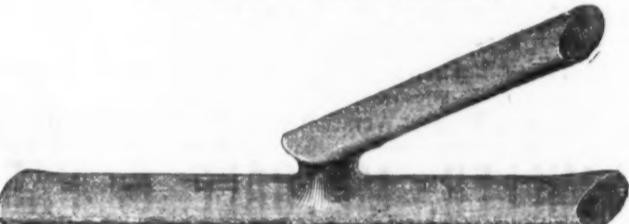
Made from one piece of best Norway Iron, under letters patent of Oct. 22, 1873, and Dec. 21, 1874. Two sizes: $\frac{3}{8}$ and 7-16, and $\frac{1}{2}$ in. Two dozen in a box.

No. 2, OFFSET.



Forged from one piece of Norway Iron. Made under patents of Oct. 22, 1873, and Dec. 21, 1874. Four sizes: $\frac{3}{8}$, 7-16, $\frac{1}{2}$ and 9-16 in. Two dozen in a box.

No. 7, NEW OVAL OFFSET.



Made from best Norway Iron, under letters patent of Sept. 1, 1874. Five sizes, $9-16 \times \frac{3}{8}$, $\frac{3}{8} \times \frac{3}{8}$, $\frac{3}{8} \times 7-16$, $\frac{3}{8} \times \frac{3}{2}$ and $1 \frac{1}{2} \times \frac{3}{8}$ in. Two dozen in a box.

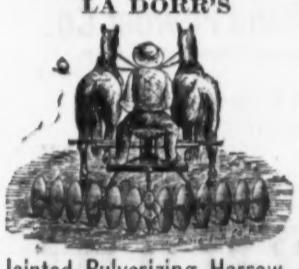
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Eagle Rake.

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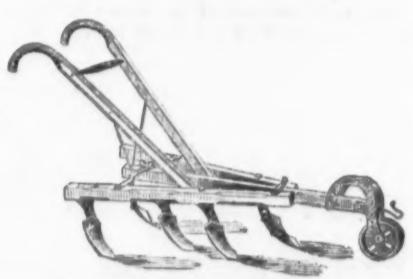
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Tolley's Champion Cultivator.

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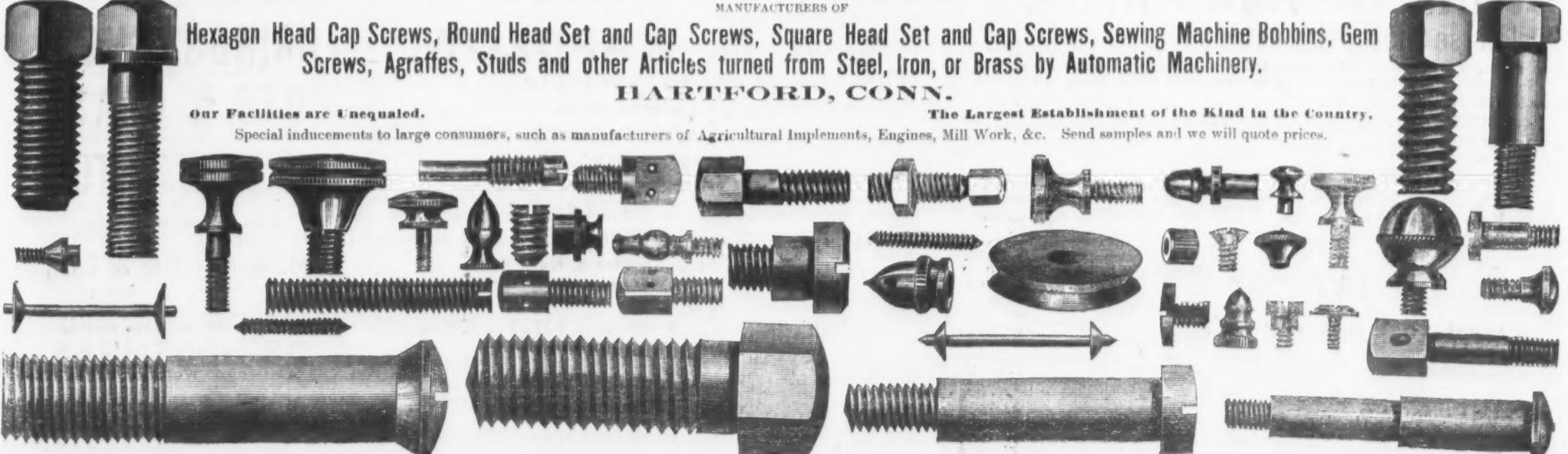
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ORANGE LIGHTNING,**ORANGE DUCKING,****ORANGE RIFLE.**

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Of all description.

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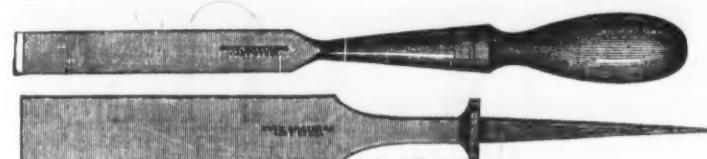
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Adjustable Stock and Dies For Pipe and Bolts,

Have the following advantages:

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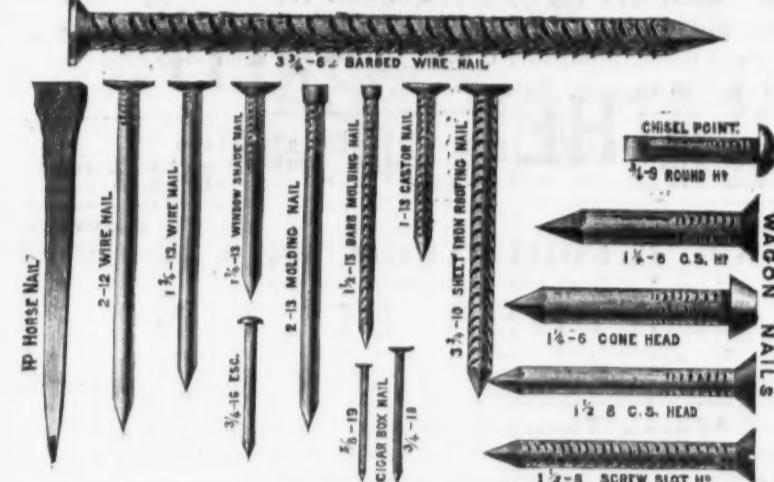
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They are nicely packed in boxes, one dozen each, of 50 lbs. weight, suitable for shipping by land or water to any part of the world.

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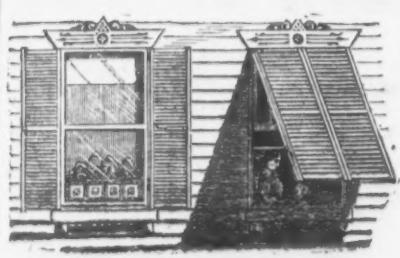
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Either old or new Blinds thus fitted can be opened in the usual way or used as an awning at pleasure.

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Improved with Rowell's Double Cog-Wheels on both ends of each roll.

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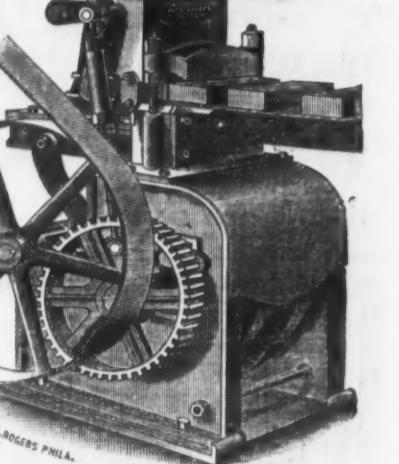
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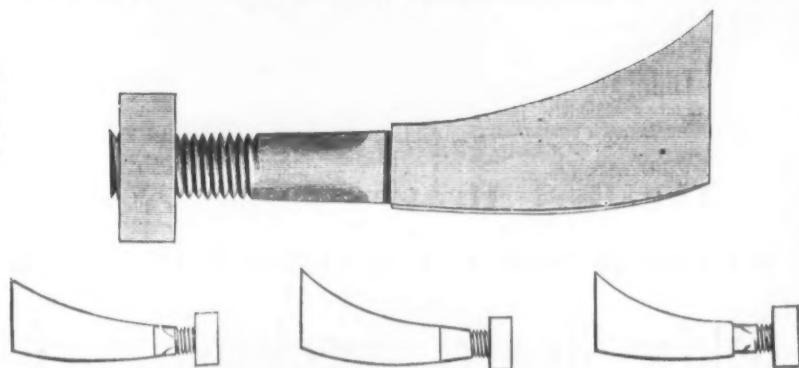


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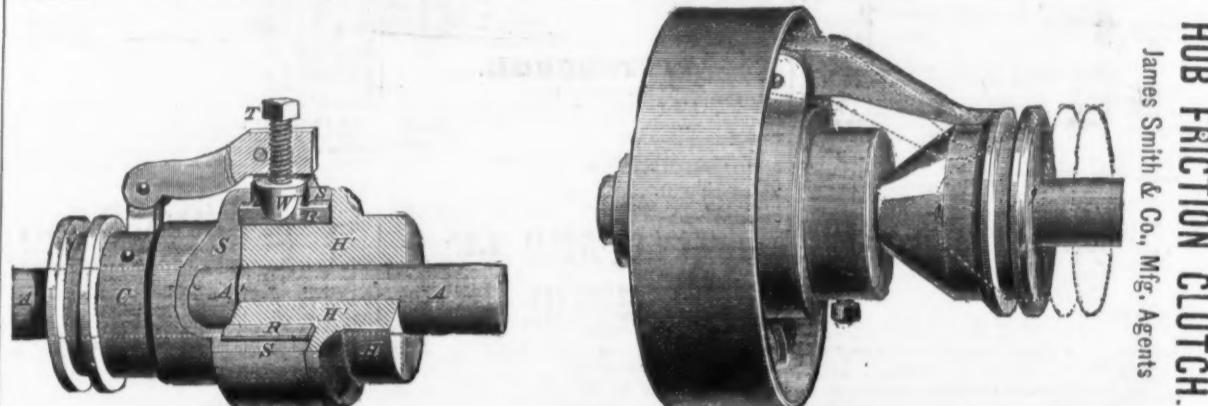
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Expanding, Self-Draining
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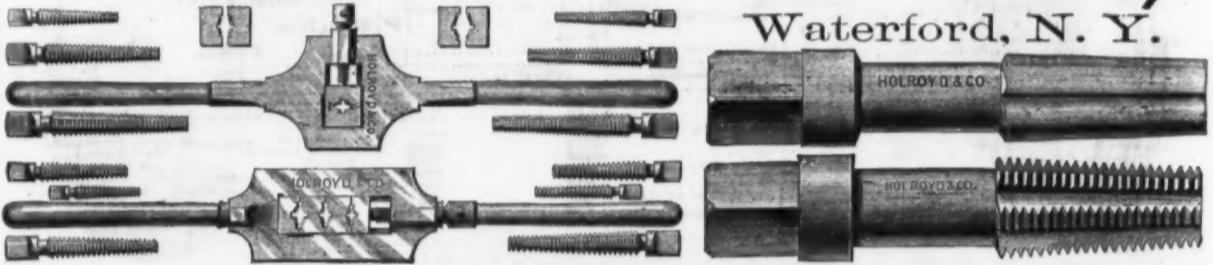
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For lifting carriages,
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will not mar the finest
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GERMAN,
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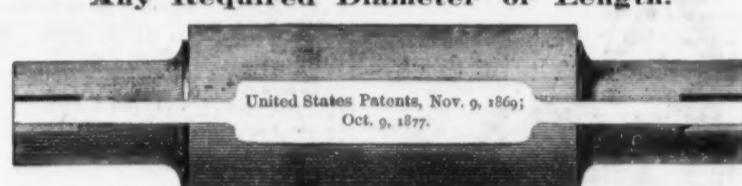
and that he bestows special attention upon a
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ONLY MANUFACTURERS.

Any Required Diameter or Length.



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We think the principle upon which they are made is the correct one, and after a severe trial, that they will last longer than any other chilled roll, and are less liable to checks, and the expansion and contraction is much more uniform and gradual throughout the entire body of the roll, all of which tend to make the gauge of the plates more equal. Our roller, a very competent one, says they are the best rolls he has ever worked at, preferring them to any other make.

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NEW sizes Patent Malleable Iron Oilers,
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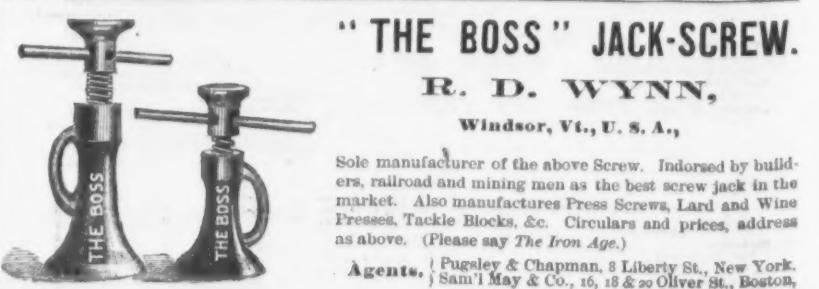
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Of superior quality, and Hardware Specialties in
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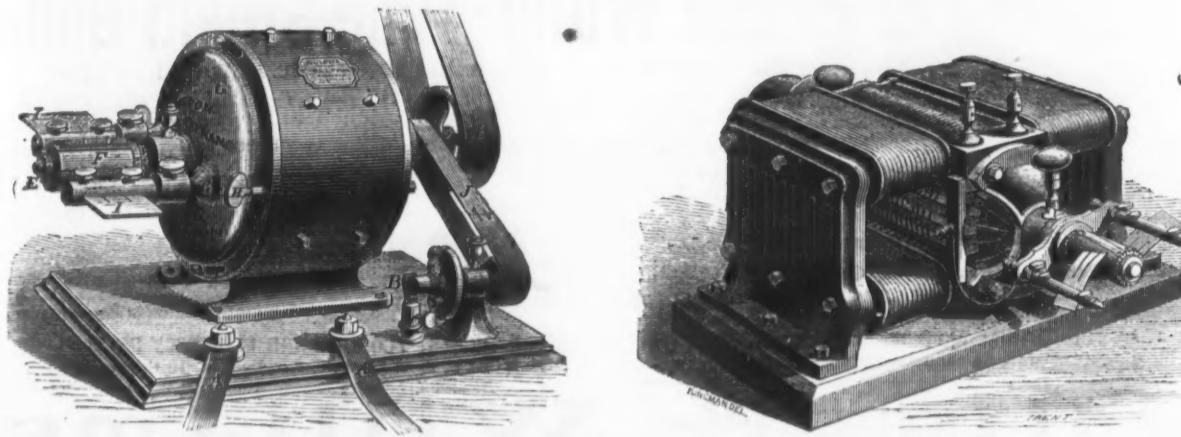
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Patented in Great Britain

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These we offer to the Trade, feeling confident of their superiority to any other door knobs in the market. Our new method of extension is simple, durable and perfect.

Our Knobs can be adjusted to doors of any thickness without the annoyance of the old-fashioned washers and pins.

We feel confident that a trial will make plain their merits.

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" 9 1/2, 16, 4, straight..... \$10.00, dis 2.50

" 9 1/2, 16, 4, twisted..... \$10.00, dis 2.50

" 10 1/2, 18, 4, straight..... \$10.00, dis 2.50

" 10 1/2, 18, 4, twisted..... \$10.00, dis 2.50

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" 16 1/2, 30, 4, twisted..... \$10.00, dis 2.50

" 17 1/2, 32, 4, straight..... \$10.00, dis 2.50

" 17 1/2, 32, 4, twisted..... \$10.00, dis 2.50

" 18 1/2, 34, 4, straight..... \$10.00, dis 2.50

" 18 1/2, 34, 4, twisted..... \$10.00, dis 2.50

" 19 1/2, 36, 4, straight..... \$10.00, dis 2.50

" 19 1/2, 36, 4, twisted..... \$10.00, dis 2.50

" 20 1/2, 38, 4, straight..... \$10.00, dis 2.50

" 20 1/2, 38, 4, twisted..... \$10.00, dis 2.50

" 21 1/2, 40, 4, straight..... \$10.00, dis 2.50

" 21 1/2, 40, 4, twisted..... \$10.00, dis 2.50

" 22 1/2, 42, 4, straight..... \$10.00, dis 2.50

" 22 1/2, 42, 4, twisted..... \$10.00, dis 2.50

" 23 1/2, 44, 4, straight..... \$10.00, dis 2.50

" 23 1/2, 44, 4, twisted..... \$10.00, dis 2.50

" 24 1/2, 46, 4, straight..... \$10.00, dis 2.50

" 24 1/2, 46, 4, twisted..... \$10.00, dis 2.50

" 25 1/2, 48, 4, straight..... \$10.00, dis 2.50

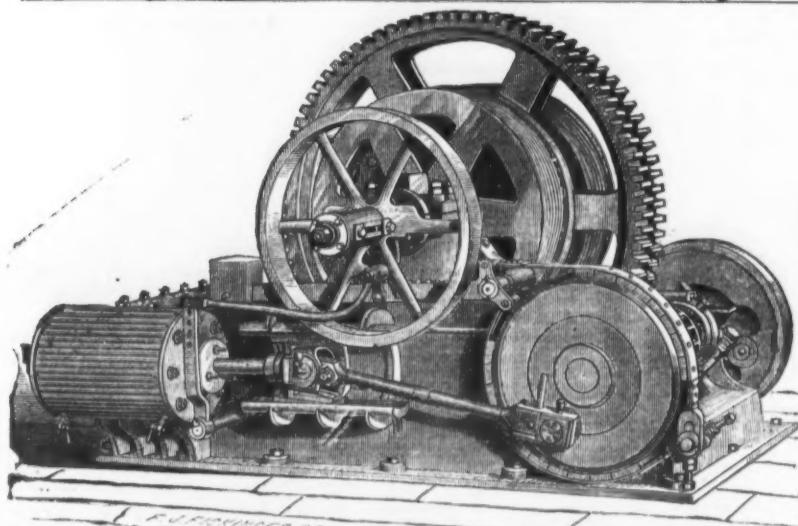
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" 26 1/2, 50, 4, straight..... \$10.00, dis 2.50

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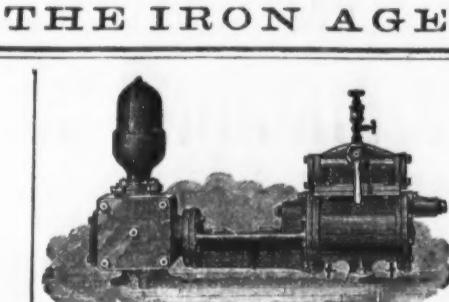
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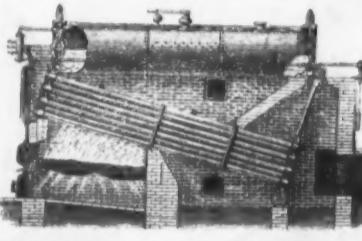
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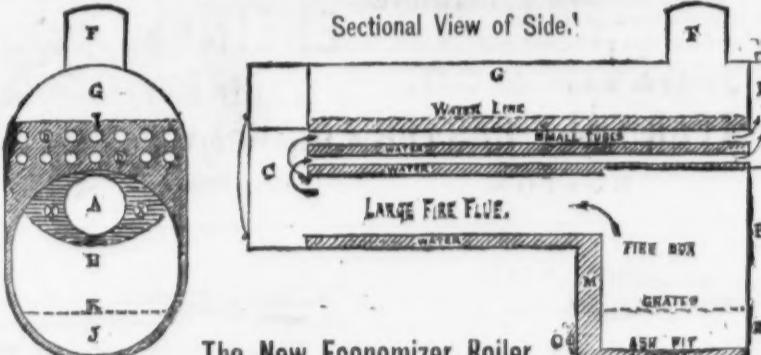
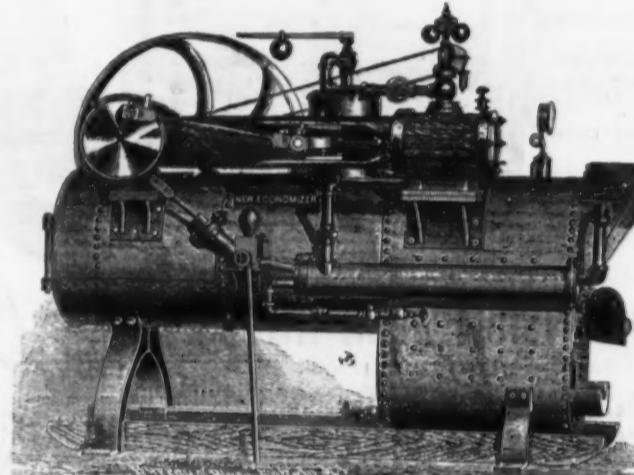
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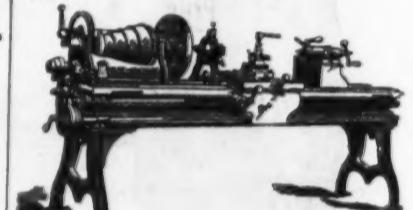
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The Emperor Don Pedro, accompanied by Director General Goshorn, Superintendent Albert, and others, visited Machinery Hall at the Centennial on the evening of June 28th. Among other things inspected, at the invitation of E. M. BOYNTON, of New York, they witnessed the trial of the New Patent Lightning Saw. The saw cut a solid log of pine wood, one foot extreme diameter, in 36 seconds, or at the rate of a cord of wood in five minutes. Messrs. Corliss, Morell, Lynch, and other members of the commission, witnessed the trial and timed the cutting. The Emperor remarked, "That was fast, very fast cutting." Last evening the Emperor made another examination of the saw.—Philadelphia Press, June 30.

BOYNTON's Saws were effectually tested before the Judges at the Philadelphia Fair, July 6th and 7th. An ash log, 11 inches in diameter, was sawed off, with a 1/4 foot lightning cross cut, by a man, in 36 seconds, or 5 seconds less than the time of the best saws of the Centennial Judges of Clean & Free. The speed is unprecedented, and would cut a cord of wood in 4 minutes. The representatives of Russia, Austria, France, Italy, Spain, Bulgaria, Sweden, England, and several other countries were present, and expressed their high approbation. The Fair and the Emperor were greatly pleased. The "Gooch" challenge was prominently displayed for six months, and the numerous saw manufacturers of the world dared not accept it, or test in a competition so hopeless.



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